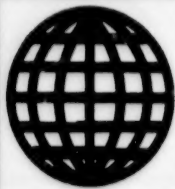


JPRS-TEN-94-025

3 October 1994



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JPRS Report

Environmental Issues

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Environmental Issues

JPRS-TEN-94-025

CONTENTS

3 October 1994

INTERNATIONAL

EU To Act on Kola Nuclear Problems If Norway Joins	1
Joint Ecological Project With Germany Set Up in Anhui	1
Britain, Ghana To Urge More Controls of Wildlife Trade	2
U.S. Power Company To Fund Environment Joint Venture	2
Far East Radioactive Waste Facility Agreed With Japan	3
Cooperation, Consultation Accords Signed With Russia	3

AFRICA

REGIONAL AFFAIRS

Conference Issues Declaration on Nature Reserves	4
--	---

SOUTH AFRICA

Government Seeks Lifting of Ban on Ivory, Rhino Horn Trade	4
Civil Unrest, Population Growth Threaten Environment	4
Oil Company Commits to Ecotourism	5
Nation To Join World Conservation Union	5
Official Denies Deadlock on Elephant Products Trade	6
Official Says Poverty Biggest Threat to Environment	6
Ministry Calls Report on Toxic Waste Dumping 'Blatant Lie'	6
Commission To Investigate Illegal Ivory, Rhino Horn Trade	7
Wood Fuel Crisis in Africa Needs 'Urgent Action'	7
Minister—Agriculture Cannot Ignore 'Green Consumerism'	7
Ministry Denies Report on Toxic Waste	8
New Policy Proposal To Allow Import of Toxic Waste	8

CHINA

Environmental Summit To Be Held in Hong Kong 7-12 November	10
Yunnan Seeks To Control Worsening Water Loss, Soil Erosion	10
Beijing Succeeds in Curtailing Auto Emissions	10
Fujian Enacts Laws To Protect Cultivated Areas	11
Suzhou Reports Improvements in Environmental Quality	11
Symposium Studies Radioactive Environment Management System	11
Scientists Preparing Further Antarctic Research	12
Article Views Recycling of Renewable Resources	13
Zhejiang Province Fulfills Mountain Afforestation Target	13
Experts Back Plans for Arid Environment Research Laboratory	13
Beijing Issues Nature Reserve Protection Regulations	13
Li Peng Promulgates Natural Preserves Law	14

EAST ASIA

REGIONAL AFFAIRS

Mekong Nations Agree To Ban Hazardous Waste Shipments on River	15
--	----

AUSTRALIA

- Government Denies Urging India To Accept Toxic Waste 15

INDONESIA

- Environmentally Oriented Product Labeling Discussed 16

JAPAN

- Tokyo To Propose Creation of APEC Energy Body 16

SOUTH KOREA

- South Runs Risk of Becoming Major Carbon Dioxide Producer 16

TAIWAN

- Customs Seize Over 2,000 Kilograms of Elephant Tusks 17

THAILAND

- Ground Water Pollution, Waste Disposal Problems 18

VIETNAM

- Funds Budgeted for Reforestation 18

EAST EUROPE

CZECH REPUBLIC

- CEZ Policy Calls for Modernized Coal, Nuclear Plants 19

ROMANIA

- Excessive Mercury Concentration Found in Drinking Water 19

LATIN AMERICA

REGIONAL AFFAIRS

- Southern Cone Environmental Issues 20
Central American Delegations Define Miami Summit Position 21
Nicaraguan President Chamorro Opens Ecological Summit 21
Salvadoran President Arrives for Ecology Summit 22
Foreign Minister Cited on Topics of Ecology Summit 22
Costa Rica's Figueres Defines Sustainable Development 23
Presidents Sign 'Alliance for Sustainable Development' 23

BOLIVIA

- Accord Reached With Peruvian Military on Preserving Amazon 23

COLOMBIA

- Poppy Cultivation Causing Deforestation 24

PERU

- Report Claims Deadly DEA Spray Destroying Fruit Plantations 25

CENTRAL EURASIA

REGIONAL AFFAIRS

Effects of Nuclear Blasts Detailed	26
Vorontsov Ponders Caspian Pollution Threat	29

RUSSIA

Moscow on Unilateral Actions Regarding Caspian Sea	30
Fears of Russian Disposal of Foreign Waste Products	30
Europarlament Delegation Arrives in Chelyabinsk	33
Cooperation on Nuclear Accidents Agreed With Europarlament	33
Moscow Drops Opposition to Antarctic Whaling Sanctuary	33
Nuclear Waste-Clearing System Under Threat	33
Ecological Security Part of National Security	34

GEORGIA

Official Reports 800 Percent Increase in Ecological Crimes	35
--	----

KAZAKHSTAN

Former Nuclear Test Site Land Reportedly Remains Polluted	35
Extent of Lake Balkhash Pollution Noted	36

UKRAINE

Academician Urges Development of Power-Saving Technologies	36
Minister Cites New Facts on Radioactivity	37

WEST EUROPE

FRANCE

'AGRICE' Set Up To Promote Clean Agro-Food	40
MOZAIC Project Measures Ozone Concentrations From Airliners	40

GERMANY

New Hesse Environment Minister Sworn In	41
Incineration Called Acceptable Alternative To Recycling	41
Wind Tunnel Used To Mitigate Emissions	42
Use of Composting To Treat Waste Described	43
Salts Used To Capture Mercury for Clean-Up	44
Plant Converts Waste Into Raw Materials	44
Speed Limits Called Ineffective in Reducing Ozone-Producing Emissions	45
Illegal Dumping Said To Be Increasing	46
Concentrations of Hydroxyl Radicals Measured	47
Pilot Plant Decontaminates Uranium, Radium From Polluted Waters	48
Plastic Used To Filter Harmful Ozone	49
Treatment of Clear Sludge From Power Plants Described	50

ITALY

Reduction of Carbon Dioxide Emissions in Italy Studied	51
--	----

UNITED KINGDOM

Nuclear Official Views Decisions Made by Environmentalists	58
Greenpeace Alleges Safety Laws Broken at Nuclear Waste Site	59

EU To Act on Kola Nuclear Problems If Norway Joins

BR1710163994 Oslo AFTENPOSTEN in Norwegian
14 Oct 94 p 2

[Ole Mathismoen report: "Norwegian Yes to EU Ensures Funds for Kola Peninsula"]

[FBIS Translated Text] Murmansk, Icebreaker Sibir—EU Commissioner Ioannis Paleokrassas made this sensational promise yesterday during a visit to Atomflot in Murmansk, the base for the civilian nuclear-powered icebreaker fleet.

So far the EU has spent 3.4 billion kroner to make nuclear power plants in Eastern Europe safer. Only 134 million have been used for securing atomic waste. Only trifling amounts of this have been spent in the northern regions.

"Until now the EU has not had a common border with the Kola Peninsula. Our involvement in the north will of course increase if Norway, Sweden, and Finland join," Paleokrassas said.

"If Norway becomes a member, we can start taking further action immediately. Bellona's [Norwegian environmental organization] outstanding report will serve as the basis for talks between Russia, Norway, the EU, and Bellona, in order to reach an agreement on what must be done, how quickly, and at what price. With our own special funding and program, we can ensure that something happens on the Kola Peninsula," Paleokrassas said during a mini-seminar which the Murmansk Shipping Company and Bellona held yesterday on board the nuclear icebreaker Sibir. When giving aid for nuclear projects, the EU usually follows the recipient country's priorities.

Also Military

Just as sensational was Paleokrassas' answer to the question of whether the EU is willing to assist in cleaning up and making safe military nuclear waste from the Northern Fleet.

"Our efforts will be wasted if we don't see these things in context," he said.

In the last few years the Norwegian authorities have been given the cold shoulder by the EU itself when it came to the Kola Peninsula. EU help has been sufficient to cover certain measures to improve the safety of nuclear power plants, but the Union has not been interested in waste, partly because it is seen as a national responsibility in the EU countries. And no one has wanted to hear any talk at all of military waste in Brussels.

Paleokrassas' visit is the first by such a high-level EU official to the northwest Russian region. He was invited by the Conservative Party to participate in a public meeting in Kirkenes yesterday evening. Bellona used the opportunity to haul him off to Murmansk, so that the

upper echelon of the EU could experience the physical and social decay firsthand, as well as see the critical situation in the handling of nuclear waste.

Shocked

Paleokrassas was shocked by what he saw. He was able to say that he has already been in contact with the Russian environment minister about the crisis in the north, and that he will soon be going to Moscow, one of the reasons for the trip being to continue discussions of this problem. His secretariat in Brussels has been working on the matter for a year, and that was the reason he could be so concrete about the EU's future help for the Kola Peninsula.

"Bellona's report on the northern regions has been very useful for us in our work thus far. For the first time, a report puts the problems in perspective and lays a good foundation for the detailed plans to come," the EU commissioner said.

Bellona was praised lavishly for its work by both high and low at the conference. Security chief Mikhail Filippov of Atomflot: "I am very pleased about Bellona being the first environmental organization which not only criticizes us but also suggests remedial measures and concrete projects. We have them to thank that we have now signed a statement of intent to build a floating dock for the storage ship Lepse," said Filippov, who strongly emphasized that waste from nuclear installations on the Kola Peninsula far exceeds storage capacity and that an immediate solution is needed.

Joint Ecological Project With Germany Set Up in Anhui

OW1810105194 Hefei Anhui People's Radio Network
in Mandarin 1100 GMT 11 Oct 94

[From the "Provincial Hookup" program]

[FBIS Translated Text] A ceremony was held in Hefei on 10 October for the signing of a memorandum of understanding between China and Germany on a technical survey for the ecological shelterbelt project in the middle reaches of the Chang Jiang in Anhui Province. Wang Zhaoyao, member of the standing committee of the provincial party committee and vice governor, attended the signing ceremony.

Since 15 September, Dr. (Liz) and Dr. (Petrov), who were dispatched by the German Government, together with the Forestry Resources Laboratory of the Anhui Agricultural University, the provincial Forestry Science Institute, and the provincial Forest Pests and Diseases Prevention and Treatment Center, conducted a survey on plant resources, soil erosion, and the prospects for the development and utilization of beach resources in Yuexi, Taihu, Susong, Wangjiang, and Dongzhi counties along the Chang Jiang. A feasibility report was prepared based on the survey.

In his speech, Wang Zhaoyao said: The Sino-German project provides a good opportunity for improving Anhui's ecological environment. The Anhui provincial government will continue to attach importance to it and will actively mobilizing governments and people in the project area to implement what is required under the project plan to ensure better results.

(Zhang Hongsheng), deputy secretary general of the provincial government, and responsible comrades of provincial departments concerned attended the signing ceremony.

Britain, Ghana To Urge More Controls of Wildlife Trade

OW1710050794 Tokyo KYODO in English
0438 GMT 17 Oct 94

[FBIS Transcribed Text] Tokyo, Oct. 17 KYODO—Japan will have to overhaul its controls on the trade of endangered species if parties to an international convention governing the trade adopt proposals foreshadowed by Britain and Ghana at the convention's November conference.

The proposals, to be put to the Nov. 7-18 conference of parties to the Convention on International Trade in Endangered Species of wild fauna and flora (CITES), in Fort Lauderdale, Florida, would require member countries to set up surveillance teams involving police and customs authorities to monitor any illegal trade in endangered species.

Under a law which came into effect in April 1993, the Japanese Government currently relies on a special committee of representatives of government agencies and ministries to oversee its commitments under CITES.

But conservation groups in Japan allege that the committee has no teeth because its budget is too small and it lacks police representation.

Ghana's draft resolution calls for member countries to review their restrictions on wildlife trade and their training of persons responsible for monitoring the illegal trade.

The British draft resolution calls for member countries to set up "specialized wildlife enforcement units."

The resolution says CITES "is seriously undermined by lack of implementation and enforcement of its provisions in many countries" and urges countries "to review the adequacy of their domestic legislation for enforcing the requirements of the treaty in a practical manner."

It also specifically states that the CITES Secretariat should "promote an action-oriented approach for

responding internationally" to the illegal trade in ivory, rhinoceros horn and tiger products.

A spokeswoman for Traffic Japan, the Japanese branch of an international organization which monitors the illegal trade in wild animals and plants, said in Tokyo domestic trade in tiger and rhinoceros products is banned in many East Asian countries, including China and Hong Kong, but not in Japan.

She said the Japanese Government is likely to come under severe pressure at the Fort Lauderdale conference over this as continued domestic trade can encourage the smuggling into the country of banned products.

U.S. Power Company To Fund Environment Joint Venture

OW1510155094 Beijing XINHUA in English
1500 GMT 15 Oct 94

[FBIS Transcribed Text] Hong Kong, October 15 (XINHUA)—Shenzhen Chang Jiang New World Power Company, one of the first environmental-protection power joint ventures, was set up with an agreement-signing ceremony held here today.

The venture with an investment of 2.95 million U.S. dollars will build and operate various wind-power yards, hydro and solar facilities to generate electricity with environment protection schemes.

The newly-established company, funded by the New World Power Corporation of the United States, the China Chang Jiang Energy Co. (Group) (CJEC) of Wuhan and the Metropolitan Enterprise Corporation of Taipei, is to construct a wind power yard with a generating capacity of 20,000 kilowatts on Nanao Island off the coast of Shantou City, Guangdong Province, south China.

It will also build a wind power yard in Shenzhen City in Guangdong.

The New World Power Corporation, the American partner of the joint venture, will be responsible for financing resources, technical expertise and selection of equipment.

The CJEC will provide staffing and business contacts within the energy industry on the mainland while the Metropolitan Enterprises Corporation will be responsible for all suitable power purchase contracts in other regions.

Yu Zhian, president of the CJEC, said the joint venture is also planning to develop integrated electricity-generating facilities with hydro, solar and wind powers in the Inner Mongolia Autonomous Region, Fujian Province, Ningbo City and Zhoushan Islands in Zhejiang Province.

The CJEC is a large trans-regional group of enterprises with more than 200 member units distributed in 19 provinces, cities and autonomous regions of China with its headquarters in Wuhan City, capital of Hubei Province.

Yu said that the rich resources of wind, solar and hydro energy on earth provide a bright future for developing the new energy for the people in China and the rest of the world.

The CJEC has now operated several hydropower stations in the Philippines and southern Pacific countries.

Far East Radioactive Waste Facility Agreed With Japan

LD1410204294 Moscow Ostankino Television First Channel Network in Russian 1800 GMT 14 Oct 94

[From the "Novosti" newscast]

[FBIS Translated Text] After almost 11 months of intense consultations Japan and Russia have reached an agreement to set up a floating facility in the Far East to recycle radioactive waste formed after the dismantling of Russian nuclear submarines. Tokyo has implemented a search for companies wishing to be involved in the implementation of the project. The project will be fully financed by the Japanese Government.

Cooperation, Consultation Accords Signed With Russia

PY1410193694 Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT 14 Oct 94

[Report by Poliane Castello Branco]

[FBIS Translated Text] Brazil and Russia have signed in Moscow a treaty on partnership relations, a protocol of consultation between the two governments, and a memorandum of intent to monitor the environment.

Brazilian Foreign Minister Celso Amorim held talks with Russian Foreign Minister Andrey Kozyrev. They signed a treaty on partnership relations between Brazil and Russia representing their mutual desire to raise the level of their bilateral relations.

The ministers also signed a consultation protocol between the two ministries and a memorandum of intent on the protection of the environment.

In order to develop partnership undertakings in the fields of science and technology, space, and environmental cooperation, a Brazilian business delegation and a Science and Technology Ministry mission will soon visit Russia.

Minister Celso Amorim carried a message from President Itamar Franco to President Boris Yeltsin reiterating an invitation to the Russian leader to visit Brazil.

REGIONAL AFFAIRS

Conference Issues Declaration on Nature Reserves*MB1610165794 Johannesburg SAPA in English
1546 GMT 16 Oct 94*

[FBIS Transcribed Text] Nelspruit Oct 16 SAPA—"The Skukuza Declaration" released at the Kruger National Park on Sunday was the result of a six-day conference to discuss the future of Africa's protected areas and national parks. The Heritage 2000 World Conservation Union and Commission on National Parks and Protected Areas conference was attended by 123 delegates from more than 30 African countries and 10 international organisations.

National parks, nature reserves and other protected areas can provide great economic benefits to all the people of Africa and are often the key to sustainable development, the declaration stated.

The document, which was finalised on Sunday, said that many areas had lost their protected status under the pressures of a rapidly expanding human population, exacerbated by wars and civil disorder which brought about the collapse of administrative systems in some countries. "As a result of inadequate funding, those areas which still survive often cannot be properly managed", the declaration said.

On behalf of the delegates and conservationists across the globe, the declaration called on all governments in Africa to:

- Prepare a protected areas system plan which establishes clear national objectives and specifies how they will be achieved, including proposals for new protected areas;
- Provide protected areas with sufficient resources to enable them to yield benefits to all people;
- Negotiate additional resources available from international sources;
- Foster productive partnerships between all role players to work in partnership in support of protected areas;
- Invest in these areas, "at a time when global concern for heritage conservation is a major issue and the need for high military expenditure is declining", and
- To adhere to international agreements to conserve biodiversity and the environment, "in the spirit of commitment created by the earth summit".

"We urge everyone to strengthen efforts to conserve nature for the benefit of society", the declaration concluded.

National Parks Board chief executive Dr Robbie Robinson said the Skukuza Declaration was an important document in that it highlighted the problems being faced

by national parks and protected areas throughout Africa. It also urged governments to support the endeavours of park managers and conservationists to preserve these areas.

SOUTH AFRICA

Government Seeks Lifting of Ban on Ivory, Rhino Horn Trade*MB0710093994 Johannesburg SABC TV 1 Network
in English 1800 GMT 6 Oct 94*

[FBIS Transcribed Text] The government is presently facing increased international pressure to rethink its planned proposal to the Convention for International Trade in Endangered Species, CITES, in America next month. The government intends asking for the ban on trade in ivory and rhino horn to be lifted. Just three weeks ago, a commission was appointed by the government to investigate claims of alleged military involvement in poaching and illegal dealing in rhino horn and elephant tusks in the late 80's. Nan Roux reports: [begin recording]

Roux: The ban on elephant and rhino trade was implemented in 1990. It was intended to give the animals a chance to repopulate the areas where they had been almost poached out. South Africa feels that the time has come to lift the ban, as it is managing its rhino and elephant populations, but it is feared that the lifting of the ban will allow poaching to resume. At a news conference in Johannesburg today, the international Environment Investigating Agency [EIA] called on the government of national unity to investigate claims of alleged military involvement in poaching and illegal trade in the late 80's. The agency believes those military syndicates involved then still exist today, and will start operating again as soon as the ban is lifted.

Environmentalist Allan Thornton: We really have to get it out in the open and make a clean sweep of it (?or else) this network will continue to exist and it can pop up and start working at any time.

Roux: The EIA also said that if the South African Government goes ahead with its proposal the elephant issue will once again dominate the CITES meeting and other issues will be sidelined. Meanwhile, the government has already approved a commission to investigate the claim. The commission will be chaired by appeal court judge, Mark Kumleben. [end recording]

Civil Unrest, Population Growth Threaten Environment*MB1310112694 Johannesburg SAPA in English
1021 GMT 13 Oct 94*

[FBIS Transcribed Text] Nelspruit Oct 13 SAPA—Civil unrest, a lack of resources and finances and population growth are among problems facing African conservationists in their efforts to preserve wilderness areas on the

continent. This emerged during the five-day African Heritage 2000 Conference of the World Conservation Union and the Commission on National Parks and Protected Areas at the Kruger National Park in the Eastern Transvaal on Thursday.

Some 150 delegates at the conference, including representatives from more than 30 African countries, agreed that an extensive action plan needed to be established to deal with problems associated with protected areas. Historically protected areas have come under pressure because of population growth and the need for land for, among others, agricultural development.

Problems were especially acute in West Africa where protected areas were sometimes shared between countries who had conflicting policies on conservation. This area was also experiencing a lack of education and training and encroaching desertification, which had dumped the region into an ecological crisis in the past ten years.

Problems highlighted in southern Africa included poor long-term security of some protected areas. The conference also highlighted the need to involve those communities bordering protected areas in preserving their regions. Delegates from southern Africa suggested the government should subsidise the management of protected areas in the sub-region.

A workshop on these issues concluded that the African continent needed to address poverty and social issues in relation to protected areas and that there should be international co-ordination to oversee the management of these regions.

Oil Company Commits to Ecotourism

*MB1310105594 Johannesburg SAPA in English
1002 GMT 13 Oct 94*

[Report by Micel Schnehage]

[FBIS Transcribed Text] Nelspruit Oct 13 SAPA—Engen Limited on Thursday committed itself to ecotourism and released a comprehensive tourism manifesto at the African Heritage 2000 Conference at the Kruger National Park in the Eastern Transvaal.

In the manifesto the petroleum company pledged to encourage and support environmentally balanced tourism development, to facilitate travel, to promote awareness of the link between tourism and the environment and to promote conservation of the environment, arts and culture. "In the new social order emerging in this country, there is nothing that can do so much for so many in less time...And for longer, than environmentally balanced tourism development for the benefit of all", Engen chief executive officer Rob Angel said in the manifesto.

Figures quoted by the World Travel and Tourism Council said tourism generated more than R10.5 trillion

[rands] of world output, amounting to six per cent of the world gross national product. The council predicted that the tourism industry would double by the year 2005.

The manifesto supported statements by the World Conservation Union and the Commission on National Parks and Protected Areas workshop that tourism could contribute towards socio-economic development on the African continent. "If you consider the options available through which to engender growth, stimulate investment, earn foreign currency...And the advancement of peace and goodwill, few if any come even close to the contribution tourism and especially ecotourism could make," the document stated.

It further stated that South Africa's re-entry into the tourist market would also mean a recognition that while all people enjoyed the basic right to travel and share in the environment, it also had to accept an obligation to protect that environment. The manifesto said Engen would promote community involvement, create environmental concern and would plan to ensure sustainable growth in South Africa.

Nation To Join World Conservation Union

*MB1310102294 Johannesburg SAPA in English
0943 GMT 13 Oct 94*

[Report by Micel Schnehage]

[FBIS Transcribed Text] Nelspruit Oct 13 SAPA—Years of isolation for South Africa from the international environmental community is set to end with the establishment of a World Conservation Union (IUCN) office in this country.

Speaking at the IUCN's fifth international congress African Heritage 2000 Conference at the Kruger National Park in the Eastern Transvaal on Thursday, IUCN Director General David McDowell said the movement would establish a base in South Africa "very soon" to facilitate international co-operation on environmental issues. South Africa's transition to a democracy following the April election was described by Mr McDowell as "a great leap forward" which would encourage an exchange of "global knowledge and expertise" on conservation in the international sphere.

"South Africa itself has expertise, and knowledge and resources which will be of benefit to the whole sub-region (of Africa)...It will be a two-way process", Mr McDowell added. Regarding the future of protected areas in South Africa he said it was imperative that communities living around these areas be involved in preserving them. He stressed that there were real benefits, both economic and social, to be gained from their involvement.

Electric fences surrounding protected areas would not guarantee their protection, but if communities were involved and benefited from a protected area then they would "see some point in their helping out in the protection policy and (that) there is much more benefit

to be had." Delegates at the five-day workshop stressed that while ecotourism played an important role in economics it also had pitfalls which had to be avoided.

Conservation bodies have predicted that the global tourist market could grow to 400 million by the end of this century which could put physical pressure on the protected areas of Africa. These pressures would include pollution, and the destruction of wild animals and their environment. Measures would have to be introduced to prevent this, Mr McDowell said. The benefits of protected areas needed to be spread among all roleplayers and should not be restricted to "a few commercial enterprises", Mr McDowell concluded.

Official Denies Deadlock on Elephant Products Trade

*MB1310062394 Johannesburg SAPA in English
2114 GMT 12 Oct 94*

[FBIS Transcribed Text] Pretoria Oct 12 SAPA—Environment Minister Dawie de Villiers on Wednesday denied reports of a cabinet deadlock on the question of trade in elephant products. He said through a spokesman in Pretoria the matter, discussed in cabinet earlier in the day, could not be finalised because time ran out and because he wished to provide his colleagues with more information on the issue.

"There is no question of a deadlock. The matter is simply standing over until next week's cabinet meeting," Dr de Villiers said. The issue concerns proposals submitted to the Convention in Trade on Endangered Species (CITES) for next month's CITES conference in the United States. The proposals were submitted by the former National Party government.

Dr de Villiers on Wednesday afternoon called off a press conference on the matter, which led to reports of a deadlock in cabinet. Dr de Villiers was expected to announce whether South Africa would keep on the table or withdraw a proposal to downgrade the protected status of elephants and legalise trade in hide, meat, ears, and feet. Proposals to CITES have to be submitted 300 days before the conference which means that South Africa will not be able to amend its proposal. It could, however, be withdrawn.

Official Says Poverty Biggest Threat to Environment

*MB1110205594 Johannesburg SAPA in English
2021 GMT 11 Oct 94*

[FBIS Transcribed Text] Nelspruit Oct 11 SAPA—The most severe threat to our natural environment is poverty, Minister of Environmental Affairs and Tourism Dr Dawie de Villiers said on Tuesday.

Speaking at the start of a conference arranged by the World Conservation Union's (IUCN) Commission on National Parks and Protected Areas, "Africa Heritage

2000", at the Kruger National Park in the Eastern Transvaal, Dr de Villiers said poverty increased the pressures on scarce and fragile resources and needed to be addressed. He added sustainable development had not been productive enough in a socio-economic sense and South Africa's national assets had to be transformed into forces which could "raise us to new levels of sustainable development."

Addressing about 150 delegates at the conference, called to determine the future of protected areas in Africa, Dr de Villiers said management of the continent's protected areas should involve local communities "thereby creating regional economies and encouraging rural development." In a prepared speech, he said in the agricultural sector ways could be explored to combine farming and conservation without endangering wildlife. In the mining sector there were ways in which regions could benefit through nature conservation, while in the industrial sector Africa could become a leader in orientating activities toward environmentally friendly practices, Dr de Villiers added.

He highlighted the importance of tourism as a source of revenue and as the world's largest and fastest growing industry. "It (tourism) already generates six per cent of global GNP (gross national product), no less than US\$3.5 trillion, and by the year 2000 it will be the world's largest industry."

Dr de Villiers added the African continent's natural resources distinguished it from other continents. "The challenge we now face is how to turn this great asset into a locomotive for socio-economic development while at the same time retaining the beauty, splendour and magic of nature." In a short message to conference delegates, President Nelson Mandela said the challenge facing Africa was to find ways to use and expand its natural resources to the benefit of its people and for prosperity. "I believe African countries can become world leaders in preservation and promotion of humanity's natural heritage," he said.

The delegates come from 31 African countries as well as the United States, Britain, France, Australia, Pakistan and Mexico. They will work to develop an action plan for the establishment and management of a comprehensive system of protected areas south of the Sahara.

Ministry Calls Report on Toxic Waste Dumping 'Blatant Lie'

*MB1410162994 Johannesburg Radio South Africa
Network in English 1500 GMT 14 Oct 94*

[FBIS Transcribed Text] The Ministry of Environmental Affairs has denied reports that it plans to raise foreign exchange by allowing toxic wastes to be dumped in South Africa.

It called the report, which appeared in a weekly newspaper today, a blatant lie. The ministry said it had published a draft policy on the management of toxic

waste for public comment at the end of last month. The policy was intended to contribute to environmental conservation without damaging the economic development of the country.

Commission To Investigate Illegal Ivory, Rhino Horn Trade

*MB1410160094 Johannesburg SAPA in English
1257 GMT 14 Oct 94*

[FBIS Transcribed Text] Nelspruit Oct 14 SAPA—A commission of inquiry has been established to investigate illegal trade in ivory and rhinoceros horn in South Africa. The announcement was made by the chief executive of the Natal Parks Board, Dr George Hughes, at the Heritage 2000 World Conservation Union and Commission on National Parks and Protected Areas Conference in the Kruger National Park on Friday [14 October].

Addressing delegates at the congress Dr Hughes said State President Nelson Mandela had commissioned the inquiry by proclamation, under the chairmanship of Mr Justice M E Kumbleben.

The commission will investigate the alleged smuggling of ivory and rhino horn, particularly those of Angolan and Mozambican origin to and through South Africa over the past 10 years. It will also investigate the alleged involvement of South Africans in this illegal trade as well trade of ivory and rhino horn of South African origin. The commission will also make recommendations on how to prevent this illegal trade.

Members of the public with information or suggestions to submit to the commission have been urged to do so in writing on or before December 10. Submissions can be addressed to "The Commission of Inquiry, P O Box 6028, Durban, 4000".

In an interview with SAPA, Dr Hughes said the formation of a commission had first been mooted about five years ago when a group of conservationists made submissions on the issue to the United States Congress. Conservationists at the time had expressed serious concern about the illegal trade through South Africa. Dr Hughes said that although trafficking in ivory and rhino horn was "not quite as serious as it could be" it was still at unacceptable levels.

Wood Fuel Crisis in Africa Needs 'Urgent Action'

*MB1410143794 Johannesburg SAPA in English
1155 GMT 14 Oct 94*

[FBIS Transcribed Text] Cape Town Oct 14 SAPA—The wood fuel crisis in sub-Saharan Africa was alarming and needed urgent action, United Nations environment programme assistant executive director Dr Jan Huismans said on Friday. Kenya-based Dr Huismans was speaking in Cape Town at the World Energy Council's forum on southern and East Africa.

He said the most pressing problem in developing countries related to unsustainable and inefficient use of biomass resources such as wood, charcoal and dung. As many as two billion people, particularly women and children, could be exposed to indoor air-pollution resulting from use of open fires for cooking and heating with inadequate ventilation. Over half-a-billion people, again mostly women in developing countries, could be at serious risk of developing respiratory problems or chronic pulmonary disease.

Indiscriminate cutting of trees and forests for wood fuels contributed to deforestation and eventually to desertification, siltation of water reservoirs, flooding and an even higher scarcity of wood fuels. This was alarming and needed urgent action. Much was already being done but because of the complexity of the issue, compounded by droughts and a series of other problems, it was difficult to formulate a policy.

Dr Huismans said substituting other fuels for biomass fuels in urban-industrial uses would mean rural areas would be under less commercial pressure for tree removal. All general improvements in rural development, and particularly of the state of women, helped. There was evidence that people who had some excess income would buy an improved stove, because it was clean, looked better and, as a side benefit, was more fuel efficient. There was also scope for increasing the availability of wood fuels, without reducing food production, by introducing appropriate species of vegetation. There should be more emphasis on "integrated biomass management" based as much as possible on traditional practices.

Minister—Agriculture Cannot Ignore 'Green Consumerism'

*MB1710180394 Johannesburg SAPA in English
1713 GMT 17 Oct 94*

[FBIS Transcribed Text] Johannesburg Oct 17 SAPA—Agriculture and, more specifically, the grain industry could not afford to ignore the trend towards green consumerism, according to Minister of Agriculture Kraai van Niekirk.

In a speech read out on his behalf at a grain seminar organised by the South African branch of the International Association of Cereal Science and Technology at Sandton on Monday [17 October], Dr van Niekirk urged the industry to adopt a more pro-active approach to green issues.

"The power consumers can exercise through their buying habits whenever the perception exists that a product might be harmful to the environment or may institute a health risk, is a factor the grain industry must bear in mind."

He said practices such as pest and weed control could potentially contribute to negative perceptions by the consumer towards the food industry. Once a negative

perception had been created consumption and especially international demand for a specific commodity could reduce significantly, he said.

Such a situation would be difficult to rectify and could cause severe hardship for producers, Dr van Niekerk added. For this reason the grain industry could not afford to ignore the trend towards green consumerism.

Dr van Niekerk said it was expected that the next round of multilateral negotiations which would take place under the new World Trade Organisation would pay a considerable amount of attention to the environment and the green movement. "In this regard pro-active attention should be paid to the issue to ensure that South Africa, for once, is ready for the obligations that could result from these negotiations," he said.

Ministry Denies Report on Toxic Waste

MB1510182794 Johannesburg SAPA in English
2351 GMT 14 Oct 94

[FBIS Transcribed Text] Pretoria Oct 14 SAPA—The Ministry of Environmental Affairs and Tourism on Friday said a weekly newspaper's report that Minister Dr Dawie de Villiers planned to allow foreign countries to dump toxic waste in South Africa was "a blatant lie."

It said in a statement the report, under the headline "Dump Your Gunk", was "presumably aimed at inciting emotional conservation groups to take action."

"What actually happened was that the department of Environmental Affairs and Tourism published a draft policy on the management of toxic waste for public comment in the Government Gazette of September 30," the statement said. It was "out of the question" that Mr de Villiers would have hidden motives in publishing the draft policy. The government was committed to transparency and wide consultation in determining policy, "as has been applied in this case."

The statement said South Africa had recently joined the Basel Convention to manage cross-border transport and dumping of classified toxic waste. The process of developing a comprehensive management system had begun with the publication of the draft policy. Interest groups had been invited to submit their comments and proposals on the draft within 30 days.

The statement said a number of precautions against toxic waste had been implemented through legislation. Also, minimum requirements and regulations for dumping sites had been developed and released last month for public discussion and comment.

Specific draft regulations had been prepared to restrict the movement of toxic waste and to facilitate the administration of the Basel Convention. These would be published for general comment before the end of the year.

New Policy Proposal To Allow Import of Toxic Waste

MB1410210394 Johannesburg WEEKLY MAIL & GUARDIAN in English 14-20 Oct 94 p 6

[Report by Eddie Koch]

[FBIS Transcribed Text] Toxic waste shipments will be allowed into the country, according to the new policy devised by Environment Minister Dawie de Villiers. The move overturns a current ban on toxic waste imports and would make South Africa one of only two African countries that trades in industrial poisons.

Environment groups promise a nationwide campaign of civil disobedience if the proposal goes ahead and say they will mobilise support from the ANC and its allied organisations, who support a total ban on all toxic imports. A White Paper gazetted this month says the existing embargo on toxic imports into the country is not in South Africa's interests and proposes to create regions in the country where toxic material from overseas countries can be dumped.

"A blanket ban on transboundary movement of such wastes would...jeopardise and impact adversely on present economic and industrial activities," says the document. The proposal flies in the face of ANC policy that states: "We will not allow our country to become a dumping ground for toxic waste. The only reason that other countries would pay South Africa to take their toxic waste is because contractors here are allowed to cut corners that contractors in countries such as the United States and the Netherlands would be jailed for doing," says Chris Albertyn of Earthlife Africa.

"The first costs to be cut are those of protecting the health of workers and pollution of the environment..." Every other government on the continent backs Organisation of African Unity resolutions which prohibit any form of toxic material being dumped here. The OAU has also adopted the Bamako Convention which bans all imports of hazardous wastes into the continent.

A discussion document on foreign policy, released recently by the ANC, recommends that South Africa sign the convention. The move by De Villiers' department is thus likely to open rifts in the cabinet between the ANC and the National Party, which allowed toxic imports when it was in power. Environmental groups reject the White Paper's claim that South Africa has the technical expertise to dispose of toxic materials in a safe way. They say recent incidents at the Thor Chemicals plant in Natal demonstrate how incompetent local authorities are in handling these imports.

A director and two senior officials from Thor, a British-owned firm with a plant at Cato Ridge near Pietermaritzburg, are currently facing culpable homicide charges after two workers died after being exposed to high levels of mercury toxins. Another worker has been in a coma for three years due to the exposure and 28 others are

diagnosed as having mercury poisoning symptoms. Thor was provided with a permit by the old government to import large amounts of toxic materials from the United States. Rivers in the region have been also been polluted by large amounts of mercury leakages from the plant. The scandal led to the current ban being slapped on all shipments of waste into the country.

Earthlife Africa says it is mobilising its branches and allied organisations in the civic and trade union movements to resist the proposal. "There will be civil disobedience on a major scale if this passes into law," warns Albertyn. The document stipulates that a strict set of minimum standards will be developed to minimise threats from transboundary movements of toxic waste and the storage of these materials. This has been supplemented by three volumes, produced by the Department of Water Affairs, which lay down detailed guidelines for managing waste.

Officials in the Environment Department defend the paper by noting it meets requirements of the Basel Convention, an international agreement designed to ensure effective controls on transboundary movements of toxic materials. It endorses the "polluter pays" principle which states that anyone guilty of damaging the environment by mishandling waste be forced to pay for

reparations. This concedes to a demand that has long been made by the environmental movement.

The document also supports the "cradle to grave" principle, which provides for control of the entire waste cycle from the point of production to the recycling, destruction or safe disposal of these materials. Willem Scott, deputy director in charge of pollution control at the Department of Environment Affairs, told the WEEKLY MAIL & GUARDIAN the proposed relaxation on toxic imports was intended "only as a last resort under special circumstances" and there was no plan for South Africa to become a major player in the trade.

He said South Africa was not snubbing the rest of Africa by allowing limited imports as many countries on the continent were party to the Basel Convention which guides the principles of the White Paper. Human rights lawyers and green activists are worried that the proposed legislation specifically excludes organised labour from taking part in the management of toxic imports and dumping. The Thor case, they argue, shows that factory workers are frequently the first to suffer and play a vital watchdog role. According to the department, the proposal will not become law until it has been subjected to scrutiny. "The public will be given ample opportunity to comment before it is finalised," said Scott.

**Environmental Summit To Be Held in Hong Kong
7-12 November***OW0410132794 Beijing XINHUA in English
1250 GMT 4 Oct 94*

[FBIS Transcribed Text] Hong Kong, October 4 (XINHUA)—The World Congress on Urban Growth and the Environment will be held here from November 7 to 12 with the participation of hundreds of officials and experts from some 30 countries throughout the world.

Announcing the event at a press conference here today, deputy chairman of the congress, Dr. Sarah Liao, said the global congress has the strong support from China, which is expected to send to the congress some 200 environmental officials and experts from around 20 provinces.

Qu Geping, chairman of the Environmental Protection Committee under the National People's Congress, is the vice president of the world congress and will deliver a keynote speech on the opening day, Ms. Liao said.

The joint presidents of the congress are his royal highness, the prince of Wales, and the U.S. vice-president, Al Gore. "The congress has the full support of the Hong Kong Government," Liao said.

The event was initiated by industrial and commercial sponsors including World-Wide Shipping Agency Ltd., the Hong Kong and Shanghai Banking Corporation Ltd., the Swire Group, the Shell Companies in China and Hong Kong, and China Light and Power Co. Ltd.

During the six-day congress to be held at the Hong Kong Convention and Exhibition Center, a total of 46 international experts will give presentations, alongside with the five workshops on human problems, atmospheric pollution, water pollution, land use and development laws.

Describing the event as "a follow-up session to the 1992 Earth Summit in Rio de Janeiro," Liao stressed that Hong Kong is committed to play its part in the drive to reduce environmental pollution.

**Yunnan Seeks To Control Worsening Water Loss,
Soil Erosion***HK0710010694 Beijing ZHONGGUO XINWEN SHE
in English 0811 GMT 6 Oct 94*

[FBIS Transcribed Text] Kunming, October 6 (CNS)—Deputy Governor of Yunnan Province, Mr. Huang Bingsheng, made public recently that the "Implementation Methods of the Law on Water and Soil Conservation of the People's Republic of China" enacted by Yunnan Province was put in effect on October 1. The Methods had been examined and approved by the eighth session of the standing committee of the eighth Yunnan's Provincial People's Congress.

Yunnan was a mountainous province and had seen severe loss of water and soil erosion in its territory

resulted from complex natural surroundings and artificial activities, said the deputy governor.

Despite the fact that the Province had harnessed more than 16,000 square kilometer area in which loss of water and soil erosion had been rampant in more than 40 years, 146,000 square kilometer land in the Province still saw water loss and soil erosion. Due to population growth, rapid development in urban and rural areas and lacking of awareness for water and soil conservation, the worsening tendency of environmental degradation failed to be put under control. Such tendency had resulted in destruction of water conservancy facilities, rise in level of the riverbeds and severe flood, thus further worsening ecological environment, even posing a threat to people's life and property safety.

According to introduction made by director of water irrigation and hydroelectricity administrative bureau of the Province, most severe loss of water and soil erosion was seen in the Jinsha River and Beipan River areas. Top priority had been placed on these areas in environmental harness and ten counties and cities had involved since 1989. At present, improved land had surpassed the eroded land in size in key harnessing areas but environmental deterioration remained rife in other areas. It remained an arduous task for the Province to settle this problem.

Beijing Succeeds in Curtailing Auto Emissions*HK1110124394 Beijing CHINA DAILY in English
11 Oct 94 p 3*

[By Chen Chunmei: "Steering Clear of Car Emissions"]

[FBIS Transcribed Text] Beijing's efforts to control auto emissions have paid off in the past five years, especially considering the rapid growth in the number of cars, city officials say.

Though 100,000 new cars hit the capital's pavement each year, the environment has not deteriorated at the same rate, according to the Beijing Environmental Protection Bureau.

Most hazardous substances polluting the capital skies come from auto exhaust systems, explained Gu Jiacheng, deputy director of the bureau, in a recent interview. And a vast proportion of the pollution is emitted from the bloated number of taxis clogging up the highways.

But the growth in tailpipe emissions has been curtailed by a series of new regulations by the Beijing Emissions Controlling Office, which was set up in 1989.

On July 1 the capital implemented a State-mandated plan cutting allowable emissions per car. The new standard calls for the hydrogen-carbon ratio to fall to 1,200 parts per million, down from 3,000.

And carbon monoxide emissions are required to drop from 6 per cent to 4.5 per cent.

The new standards approach the international guideline of 1,000 parts-per-million hydrogen-carbon ratio and 3 per cent carbon monoxide.

Fifty to 60 per cent of the capital's 730,000 automobiles met the new requirements in a random survey completed recently. Some 70 per cent met the old standard.

Gu attributed this fall to the more stringent requirements.

In response to the new demands, the environmental bureau has specially trained more than 360 car maintenance workers and company managers.

The emissions office's new standards also require car manufacturers to install advanced exhaust systems and effective starters, such as electronic fuel injection systems, on all new cars.

Inspections of exhaust systems at car repair shops will be led by laboratories at the Beijing Jeep Co and Beijing Car Research Academy.

Cars in service must have their exhaust system checked and repaired if it fails to meet State standards.

And buyers of new cars sold in Beijing should submit the emissions indexes which must meet State standards, said Gu.

Emissions reductions also depend on improving roads, using unleaded gasoline, Gu said.

Fujian Enacts Laws To Protect Cultivated Areas

*OW1010091994 Beijing XINHUA in English
0856 GMT 10 Oct 94*

[FBIS Transcribed Text] Beijing, October 10 (XINHUA)—Southeast China's Fujian Province has taken new and strict measures to protect its cultivated areas, the EAST CHINA INFORMATION DAILY reported recently.

According to an official regulation, Fujian will place at least one million hectares, or 82 percent of the its total farmland, under protection.

Fujian, an ancestral home for overseas Chinese, has 31 million people. To ensure everyone to have enough to eat, the province needs at least one million hectares under farm crops.

Zhang Mingjun, chairman of the provincial people's congress, called the one million hectares of farmland "our lifeline".

In addition, the province has decided to take strict measures in issuing licenses for the use of capital farmland in a bid to check the use of land for non-farming purposes.

Suzhou Reports Improvements in Environmental Quality

*OW1010091094 Beijing XINHUA in English
0809 GMT 10 Oct 94*

[FBIS Transcribed Text] Nanjing, October 10 (XINHUA)—Suzhou, a tourist attraction and an economically-developed city in east China's Jiangsu Province, has focused on environment protection while boosting economy.

At present, all the drinking water sources in Suzhou's rural area have reached the national standard, and 80 percent of the water surface and 85 percent of the air are clean.

The city was listed as one of the top ten cities by the central government for its achievements in this field in 1992.

To protect the environment, Suzhou has issued a series of regulations since the late 1980's to its 14,000 township enterprises, which generate 70 percent of the city's total agricultural and industrial output.

At the same time, the city has spent 820 million yuan in this field, accounting for 10.6 percent of the fixed assets investment.

Over the past six years, Suzhou has reduced the number of polluting enterprises to less than five percent of the city's total, and moved a large number of enterprises discharging heavy pollutants away from scenic spots, drinking water sources and the urban area.

In addition, the city has equipped rural industrial enterprises with over 900 sets of pollution-control facilities.

The city forbids the establishment of new enterprises discharging heavy pollutants.

Symposium Studies Radioactive Environment Management System

*OW0910133994 Beijing XINHUA in English
1317 GMT 9 Oct 94*

[FBIS Transcribed Text] Tianjin, October 9 (XINHUA)—The radiation levels of the radio-wastes from China's first two nuclear power plants in Zhejiang and Guangdong provinces have been strictly controlled below the state-set standards, thanks to an effective radioactive environment management system.

This was confirmed on China's first National Symposium on the Management of Radioactive Environment that closed today in this port city in north China.

The four-day symposium, sponsored by the State Bureau of Environmental Protection, is to examine the country's laws, policies, and technological standards concerning the management of radioactive environment and the implementation of them.

Experts and officials to the symposium agree that China has established in the past decade a relatively complete and effective system for the full-range monitoring of activities resulting in radiations more or less.

China has built nuclear power plants and applied nuclear technologies in industry, agriculture, medicine, geology, metallurgy, archaeology, and many other fields.

With the development of its nuclear industry, China's radioactive environment management took its first steps in the 1950's.

In the late 1970's, the country published its first radiation control policy.

In 1982, the State Bureau of Environmental Protection was recognized by the State Council as the highest and only authority in radioactive environment management.

Since then, the bureau has established its offices in all the provinces, cities, counties and a majority of radioactive source units. The whole system employs more than 1,000 people.

While making up a whole system of standards and regulations concerning the control of radioactive environment, the bureau has subjected China's first law on the prevention and handling of radioactive pollutions to the Standing Committee of the National People's Congress for approval.

The bureau has successfully organized the survey of the natural radiation level throughout the nation, the results of which have been adopted by the United Nations science committee on the effects of atomic radiation.

The country has built up urban radioactive wastes banks in 21 provinces and big cities, which now control several thousands of radiation sources and several thousands of tons of radioactive wastes.

Now all the nuclear facilities, including nuclear power plants, in the country are subject to a two-layer evaluation system by the State Bureau of Environmental Protection, one by the Expert Committee for Nuclear Environment Evaluation, the other by the Expert Technical Group for Nuclear Environment Evaluation.

So far nearly 60 nuclear facilities in the nation have passed the evaluation of the system for their impacts on the environment.

In the meantime, the management of radioactive effects associated with rare earth, nonferrous and black metallurgy, bone coal utility and other industries as well as the control of nuclear accidents has set out.

Scientists Preparing Further Antarctic Research

OW0910064994 Beijing XINHUA in English
0618 GMT 9 Oct 94

[FBIS Transcribed Text] Lanzhou, October 9 (XINHUA)—Chinese scientists are now preparing to undertake further research on the ice cap at the eastern part of the Antarctic, which is regarded as one of the crucial areas for such study.

The scientists, who have set up two scientific research stations on the continent since China started Antarctic research in 1980, have contributed some 100 theses on the ice cap, glacier, nearby seas, animals, climate and change of environment on the Antarctic.

Four achievements are remarkable, including findings on the distribution, variety and propagation of shrimp, on the relations between the radiation of ultraviolet ray and the change of the ionosphere, on the marine circulation near the Prydz Bay, and on the forming of the ice cap.

The Chinese scientists found that the ice cap was formed by condensed snow falling on the Antarctic. The snow come from water evaporated from the sea in warm areas.

The finding was partly attributed to Qin Dahe, council member of the International Glaciology Society and vice chairman of the Glaciology Working Group of the Scientific Committee for Antarctic Research (SCAR).

In 1990, Qin took part in an international research group to traverse the Antarctic. He studied samples of snow collected along the 5,896 km route which connected 104 search stations and set the standard on measuring the process of the condensity of snow into the ice cap.

He also drew a curve depicting the climate change in the past 30 years and found the relations between the ratio of stable isotope in snow and the average yearly temperature.

Qin is one of the over 300 Chinese scientists who have worked in Antarctic in the past 15 years.

The Antarctic, covering an area of 14 million sq [square] km with some 13 million sq km covered by a 2,000-m [meter] thick ice cap, were surrounded by more than 220,000 icebergs floating on the sea.

It used to be called a mysterious land as no close research on it had been made until the late 1950's.

In 1959, 12 countries signed the Antarctic Treaty which advocated the peaceful utilization of resources of the Antarctic.

China became a member state of the treaty in 1983.

Article Views Recycling of Renewable Resources

*OW0810111994 Beijing XINHUA in English
0804 GMT 8 Oct 94*

[FBIS Transcribed Text] Beijing, October 8 (XINHUA)—China has made big progress in the recycling and utilization of renewable resources over the past four decades, according to the Beijing-based MARKET NEWS.

Thanks to the utilization of renewable resources over the past four decades, China has saved the use of 4.2 billion tons of ore, 180 million cubic meters of timber, 19 million tons of soda, 580 million tons of standard coal, 59 billion kw of electricity and 120 million barrels of crude oil.

China began to recycle scrap iron and steel since the founding of the People's Republic of China. The amount recovered is enough for manufacturing 1.3 million km of rails, a length four times that of the equator, or enough for making 130 million lorries.

The comprehensive utilization of renewable resources has also helped protect the environment.

Statistics show that the recycling efforts have reduced the discharge of residue by 20-30 percent, of waste water by 30-40 percent and of waste gas by 20-30 percent.

The Anshan Iron and Steel Company, one of the largest in China, has invested a total of 70 million yuan in the construction of 58 projects for comprehensive utilization of renewable resources since 1969.

The projects recover 140,000 tons of iron powder, 2000 tons of coke, 85,000 tons of iron and steel a year and make a more effective use of 220,000 cubic meters of steam and 17.9 cubic meters of water.

Zhejiang Province Fulfills Mountain Afforestation Target

*OW1310112794 Beijing XINHUA in English
1045 GMT 13 Oct 94*

[FBIS Transcribed Text] Hangzhou, October 13 (XINHUA)—East China's Zhejiang Province has planted trees on all its barren mountains fulfilling its afforestation task one year ahead of schedule.

A recent survey shows that the province has 5.167 million hectares of forests, up from 4.376 million hectares in 1989.

The amount of timber reserves has risen from 112.457 million cubic meters in 1989 to 122.454 cubic meters at present; its forest coverage rate expanded from 45.8 percent to 54.7 percent, ranking high in the country; and the number of forest parks increased from two to 40.

A provincial official in charge of forestry attributed the good result to the redoubled efforts of local officials and a full mobilization of all social sectors in afforestation.

Experts Back Plans for Arid Environment Research Laboratory

*OW1310083494 Beijing XINHUA in English
0805 GMT 13 Oct 94*

[FBIS Transcribed Text] Beijing, October 13 (XINHUA)—The feasibility study of an open laboratory for the research of arid environment and oasis ecology recently passed the appraisal of experts in the Xinjiang Uygur Autonomous Region in northwest China.

Twenty-five noted scholars from the Chinese Academy of Sciences, scientific institutions in Xinjiang, as well as Kazakhstan and Japan agreed to build such a lab, the 'CHINESE SCIENTIFIC NEWS' reported on Monday [10 October].

The proposed lab will jointly be started by the Xinjiang Ecological Institute and the Xinjiang Geographic Institute, both under the Chinese Academy of Sciences.

The lab will concentrate its research on the development of natural resources and the protection and improvement of environment in arid areas so as to maintain a balance between the human development and environment protection, sources from the two institutes said.

Arid environment accounts for nearly one quarter of the Chinese territory and poses a special environmental issue to the nation, the sources said.

Beijing Issues Nature Reserve Protection Regulations

*OW1510154894 Beijing XINHUA in English
1514 GMT 15 Oct 94*

[FBIS Transcribed Text] Beijing, October 15 (XINHUA)—China issued today its nature reserve protection regulations signed by Premier Li Peng.

The regulations, approved by the 24th routine meeting of the State Council, will take effect on December 1.

The regulations define its nature reserves as land and water or sea areas where representative natural biological systems exist, rare and endangered wildlife inhabits and natural and historical sites of special significance are located.

The 44-article regulations spell out detailed rules for the construction, management of nature reserves and the legal responsibilities violators should take.

The regulations emphasize that it is necessary to pay enough attention to local economic development and local residents' life in the construction and management of nature reserves.

The environmental protection administrative department of the State Council is authorized to take charge of the comprehensive administration of China's nature reserves while administrative departments of agriculture, forestry and other departments concerned are authorized to be in charge of the management work within their categories.

Nature reserves are divided into two kinds: those under the state protection and others under the local government protection.

Nature reserves are also demarcated as the core areas, where natural biological systems are well preserved and rare and endangered wildlife inhabits, the intermediate areas and the areas for experimenting. No one is allowed to enter the core areas even for scientific research except for the special permission given by the state administrative department or provincial government administrations.

Li Peng Promulgates Natural Preserves Law

OW1510142294 Beijing XINHUA Domestic Service in Chinese 2059 GMT 14 Oct 94

[FBIS Translated Text] Beijing, 15 (XINHUA)—State Council Decree No. 167 of the People's Republic of China:

The "Regulations of the People's Republic of China on Natural Preserves" was approved after a discussion at the 24th State Council executive meeting on 2 September 1994 and is hereby promulgated for enforcement beginning on 1 December 1994.

[Signed] Premier Li Peng

[Dated] 9 October 1994

REGIONAL AFFAIRS

Mekong Nations Agree To Ban Hazardous Waste Shipments on River

BK0910114394 Bangkok THE SUNDAY NATION
in English 9 Oct 94 p A2

[Report by Marisa Chimprapha]

[FBIS Transcribed Text] Vientiane—Representatives from the four countries bordering the Mekong river met in the Laotian capital yesterday and adopted a proposal put forward by the Thai delegation to prohibit the river being used to transport shipments of hazardous waste.

The meeting, called to discuss transportation and tourism issues, was attended by delegates from Burma, Laos, China and Thailand. A joint committee has been set up to work out the details of the Thai proposal. Discussion at yesterday's meeting focussed on a 24-article draft agreement covering commercial shipping along the Mekong river, submitted by the Chinese delegation.

Delegates decided to delete article 18 of the agreement which proposed that shipping companies carrying goods for export be exempted from all taxes, duties and other levies.

Xai Phapsasoum, permanent secretary at the Laotian Ministry of Transport, Post and Construction, told reporters that it was decided to delete the article as delegates felt that the issue should first be examined by tax experts to ensure accuracy and fairness.

Meanwhile, Chiang Rai governor Kamon Bunchoet who attended the meeting, said it would not be possible to extend exemptions on all taxes and levies. "What needs to be considered is exactly how much each nation would need to collect to fund development projects along the Mekong river," Governor Kamon said yesterday.

The Chinese delegation agreed to draft the agreement after the four-nation group had its second meeting in China's Kunming province in January this year.

At the Kunming meeting it was agreed to allow vessels to use the river route from China's Simao province to Xieng Khouang province in Laos. However, the draft agreement presented to yesterday's meeting stated that ships using the river for commercial or tourist purposes should be allowed to use docks in the Laotian province of Luang Prabang.

Xai, speaking on behalf of the Laotian delegation, agreed to the change saying it would benefit trade and tourism in all four countries but especially in Laos itself.

"Anyway, each of the four governments will have the final say on whether or not to approve the change. After that, the four nations will meet and discuss the matter again," Xai told our reporter.

The Beijing government is reported to be considering the use of explosive charges to remove rapids and rocky outcrops along the Lansang, a tributary of the Mekong which flows through Chinese territory. However other countries with land bordering on the Mekong, particularly Cambodia and Vietnam, have expressed opposition to the Chinese proposal. They fear that removing the rapids to improve navigation on the river may result in changes in water flow which could also affect boundary markers which delineate national frontiers.

An informed source said that this matter was not raised at the meeting although delegates said they were not in favour of opening up any new navigation channels along the river.

At yesterday's meeting, the Laotian delegation insisted that the agreement should be implemented for a three-year trial period after it was signed by representatives from the four countries. Other delegates suggested that the trial period be extended to five years.

The meeting, which was chaired by Xai later decided to review article 5 of the agreement. This states that each country should agree to grant vessels from each of the other three, special customs and other clearances.

Xai commented that normally this type of "most-favoured-nation" status was only conducted between two countries.

The six-day meeting, which started Thursday, will wind up on Wednesday with the signing of the agreement.

AUSTRALIA

Government Denies Urging India To Accept Toxic Waste

LD1810141194 Melbourne Radio Australia in English
1000 GMT 18 Oct 94

[FBIS Transcribed Text] The Australian Government has rejected claims that it's trying to force India and other Asian nations to accept toxic waste from Australia.

Environment groups, including Greenpeace, have accused Australia of breaching its obligations under the Basel convention on hazardous wastes. The convention, which Australia has ratified, bans developed countries from disposing of hazardous waste in nondeveloped nations. But the government says the convention still allows trade in certain hazardous wastes which can be recycled. The meeting agreed to ban such trade from developing countries after 1997. But Australia is yet to ratify that decision.

The government says Australia presently exports \$22 million worth of hazardous wastes to developing countries—mainly India, China, Japan, and South Korea.

An Australian delegation is now in India to examine the merits of continuing such trade after 1997.

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INDONESIA

Environmentally Oriented Product Labeling Discussed

94SE0235D Jakarta KOMPAS in Indonesian
23 Aug 94 p 4

[FBIS Translated Text] Jakarta, 23 Aug—The Indonesian Government is working with Germany, through project advisory assistance to the Department of Trade, in a roundtable discussion on environmental labeling schemes and ecological product standards for Indonesia export products.

The program was opened by Paian Nainggolan, chief of the Trade Research and Development Board, in Jakarta on Monday [22 August].

According to Nainggolan, the objective of the discussion was to provide information on new standards that must be met by exporting countries.

Appearing as speakers in the discussion were Mr. Harald Neitzel and Ms. Ute Landmann of the German Environmental Agency. The two of them provided an analysis of "Perspectives on Indonesian Export Products in the Use of 'Eco-Labeling,'" particularly in anticipation of increased consumer awareness of environmental aspects.

This activity is directed toward the participation in a national form of labeling by important export products, such as plywood, garments, rubber, leather products, and several agricultural products.

Products receiving 'eco-labels' will receive benefits, because such products will be recognized nationally and would have national labels for Indonesian products that do not, or do not yet, have international criteria, such as rattan and tropical fruits.

Almost every country that imports Indonesian products imposes the national environmental labeling that applies in each country. These include the United States ("Green Seal," "Scientific Certification Systems"), Japan ("Eco Mark"), Singapore ("Green Label"), South Korea ("Cleaner and Greener"), Germany ("Umweltzeichen"), the Netherlands ("Stichting Milieukeur"), and China ("Huan").

The short study provided ideas on how to use "eco-labeling" procedures as an important part of the marketing policies of Indonesian export companies.

The use of labels promises an economic benefit, because Indonesian products will be better accepted on international markets.

JAPAN

Tokyo To Propose Creation of APEC Energy Body

OW0810074094 Tokyo KYODO in English
0704 GMT 8 Oct 94

[FBIS Transcribed Text] Tokyo, Oct. 8 KYODO—Japan will urge the Asia-Pacific Economic Cooperation

(APEC) forum late this month to establish a permanent body to discuss energy issues, officials told KYODO NEWS SERVICE on Saturday [8 October].

The officials from the Ministry of International Trade and Industry (MITI) said the body would be the APEC version of the International Energy Agency (IEA), which groups oil-consuming industrial nations under the Organization for Economic Cooperation and Development (OECD).

Under MITI plans, the proposed body will be established in three or four years to promote discussions on energy issues between industrial and developing nations, the officials said.

APEC, grouping 17 nations and regions, faces serious environmental pollution problems stemming from sharply increasing energy consumption, they said.

MITI will propose the creation of the energy body when APEC's working committee on energy meets later this month and call for further discussions on the proposal at a ministerial meeting and an informal summit to be held by APEC in Indonesia next month, the officials said.

Like the IEA, the proposed body will have no binding power on its members but will issue periodic joint statements to coordinate members' energy policies, they said.

Government estimates show energy consumption by the developing world in 2010 is likely to show a 2.2-fold rise from 1990, while global consumption is expected to rise 48 percent in the same period.

As a result, the APEC region is expected to face serious energy supply-demand and environmental problems, the officials said.

SOUTH KOREA

South Runs Risk of Becoming Major Carbon Dioxide Producer

SK1610050694 Seoul THE KOREA HERALD
in English 16 Oct 94 p 8

[By staff reporter Yu Kun-ha]

[FBIS Transcribed Text] If Korea's energy consumption continues to grow at a double-digit rate as it is now, it may soon become one of the world's top 10 producers of carbon dioxide, the main culprit for the greenhouse effect, a recent study by the nation's leading energy research institute predicts.

Korea then may be forced by an international convention on climate change to reduce its emission of carbon dioxide, which can only be achieved by painfully curtailing energy consumption at industrial plants, power stations and households.

According to the study by the state-run Korea Energy Economics Institute (KEEI), the nation's emission of carbon dioxide totaled 69 million tons of carbon (TC) in 1990, an amount large enough to place Korea 16th in the world.

Korea's rank, which is already high, is expected to further move up, possibly into the top 10, as its energy consumption growth rate is disturbingly high.

In recent years, energy consumption in Korea has been growing over 10 percent a year, far higher than the world's average growth rate of 4-5 percent and even higher than the nation's economic growth rate.

"The main reason for the rapid increase in energy consumption is the massive expansion of such energy-intensive industries as cement, steel, petrochemicals, oil refining and power generation," said Yi Un-ho, an official at the Ministry of Trade, Industry and Energy (MOTIE).

The progress in motorization of Korean society has also tended to boost energy consumption.

According to the KEEI study, the manufacturing sector accounted for 40.1 percent of the total energy consumption, the transportation sector 16.6 percent, the power generation sector 14.6 percent, the household-commercial sector 26 percent and the public sector 2.7 percent.

"This energy consumption structure suggests that when the nation is forced to reduce its carbon dioxide emission, the manufacturing sector, especially the cited energy-intensive industries, will be hit hardest," Yi said.

The pressure on Korea to contain the emission of CO₂ and other greenhouse gases comes from advanced countries which are moving to make the Framework Convention on Climate Change a tougher international agreement.

The convention went into effect in March this year to deter the worsening greenhouse effect. Under it, advanced countries are obliged to contain their carbon dioxide emission to the 1990 level by the year 2000.

This obligation does not apply to developing countries including Korea; they are instead required each to present by 1997 a detailed report on the emission of greenhouse gases in their own countries.

Advanced countries, however, are attempting to bring Korea and other leading industrializing countries under a tougher obligation on the ground that the present agreement falls short of stabilizing the density of greenhouse effect gases in the atmosphere.

"Next March, member countries of the convention will hold the first Conference of Parties in Berlin. Some advanced nations demand that the conference adopt new obligations for industrializing countries like Korea," Yi said.

This demand, according to Yi, is not likely to be realized as developing countries are strongly opposed to it.

"When seen from the standpoint of developing countries, the demand is totally unfair because the present world environmental situation is largely the result of centuries of industrialization by advanced nations," Yi said.

Developing countries indisputably have the right to pursue economic growth and industrialization. Advanced countries should be willing to recognize this right and make greater sacrifice, if necessary, to avert a possible environmental disaster.

In reality, however, national interests tend to take precedence over everything else. Therefore advanced countries want to impose the same obligations on developing countries as those put on them.

Hence, a sharp conflict of opinion is expected between developing and developed nations when they begin negotiations over the legislation of protocols for the framework convention from next March.

During the negotiations, the Seoul government will try to thwart any move to oblige it to begin efforts soon to reduce emission of greenhouse gases. The chances are higher, however, that the standard for emission control may be strengthened and its application extended.

"If our energy consumption growth rate continues to stay at a double-digit level, it will not be long that we are forced to control emission of greenhouse gases. To avoid this, we should begin now efforts to curtail energy consumption," Yi emphasized.

The government has thus far been lenient toward energy consumption. It has maintained a low energy price policy to support industrial growth. But this policy has caused an almost complete lack of concern about energy conservation among domestic industrialists.

"We need to formulate and implement a new energy policy which can contain emission of greenhouse gases without straining the industrial sector too much," Yi noted.

TAIWAN

Customs Seize Over 2,000 Kilograms of Elephant Tusks

OW0410154594 Taipei CNA in English
1330 GMT 4 Oct 94

[By Benjamin Yeh]

[FBIS Transcribed Text] Taipei, Oct. 4 (CNA)—Customs officials in the northern Taiwan port of Keelung on Tuesday [4 October] seized about 400 elephant tusks weighing a total of more than 2080 kilograms in what is believed to be the largest-ever ivory-smuggling case here.

Keelung customs officials discovered the tusks—the trade in which is banned worldwide—in a container supposedly full of African timber. The container was shipped to Keelung from Djibouti, Somalia, via Hong Kong.

The consignee is still unknown, and police are looking into the case.

According to the revised Wildlife Protection Law, which is pending the approval of the Legislative Yuan, anyone found trading in or [word indistinct] endangered wildlife or endangered wildlife products could face a penalty of up to five years in jail or a fine of up to NT [new Taiwan] \$1.5 million (U.S. 356,820). Repeat offenders could be sentenced to up to seven years in jail or fined up to NT\$2.5 million.

"The seizure of smuggled ivory is of special significance to Taiwan only a few weeks before CITES [Convention on International Trade in Endangered Species] meet to decide whether to impose sanctions against Taiwan," Chen [word indistinct]-chou, director of the Council of Agriculture's Forestry Department, said when asked to comment on the case.

The Convention on International Trade in Endangered Species is the wildlife-protection arm of the United Nations. It is meeting in Florida in early November to decide whether to sanction Taiwan for its failure to stop the illicit trade in rhino horns and tiger bones.

THAILAND

Ground Water Pollution, Waste Disposal Problems

94WN0420A Bangkok NAEON in Thai
6 Aug 94 pp 13, 16

[FBIS Translated Text] Mr. Phichit Rattakun, the managing director of the Air Pollution Control and Environmental Protection Foundation, said that Bangkok presently has to dispose of 6,200-6,400 tons of garbage a day. And of this, approximately 21.7 tons are "hazardous" materials. These hazardous materials come primarily from two sources, that is, from household waste materials and from industrial plants. This includes dry cell batteries, neon light bulbs, empty cans of insecticide, paint, and thinner, chromium-plated metals, and electronic circuit boards.

"When such hazardous waste is dumped and not disposed of properly, the hazardous materials may mix with waste water and flow into the rivers, canals, and underground sources of water. And in the end, these materials will affect people," said Mr. Phichit. He added that the tests done on samples of water taken from water sources used by the public in the Onnut, Ram Inthara, and Nong Khaem areas have shown that the water contains heavy metals such as cadmium and manganese in excess of the standards. It has also been found that people in these areas suffer from skin disorders, and some children

suffer from mental retardation. This is because most of the people use water from the wells and canals for consumption. In the past, tap water was not available.

Besides the hazardous waste disposed of by the industrial plants, such as the plants that drain batteries, the coating and dyeing plants, the metallurgy plants, the chemical plants, and the electronics factories, the most common hazardous waste is dry cell batteries. In Bangkok alone, 5,200 tons are disposed of each year.

Mr. Phichit said that it is predicted that by the year 1997, the amount of garbage will increase from 8,240 tons a day to 11,000 tons a day. If we continue to dispose of garbage by dumping it at central dumps or burying it, even larger quantities of hazardous materials from this garbage will flow into our natural water sources. He said that he has proposed that the minister of industry ask the governor of Bangkok to stop having the waste materials collected from the industrial plants mixed with household garbage. Also, the Ministry of Industry has notified the plants that they are to dispose of the hazardous materials in accord with the law.

VIETNAM

Funds Budgeted for Reforestation

BK0510164594 Hanoi VNA in English
1226 GMT 5 Oct 94

[FBIS Transcribed Text] Hanoi VNA Oct. 5.—The Vietnamese Government, in 1994, allocated 540 billion dong (USD 50 million) to a national programme codenamed 327 on regreening bare hills and settling down nomadic tribes. As a result, 45,000 hectares out of 62,000 ha were covered with forests, and 150 million scattered trees were planted in the first six months of this year.

The programme also includes the protection of two million out of the existing 5.3 million ha of forests and the restoration of 368,000 ha of devastated and depleted forests.

According to the State Planning Committee, a sum equal to 800-850 billion dong (USD80 million) will be given to the programme in 1995 in order to protect another 2.5 million ha of existing forests and to restore some 250,000 ha more.

The programme aims at regreening three million ha by the year 2000 and all the current nine million ha of bare hills in the next 15 years.

In 1993, the first year of implementing programme 327, with 410 billion dong (USD 40 million), 49,000 ha were covered with forests, 8,000 ha were planted minorities were helped to switch to sedentary farming and life.

CZECH REPUBLIC

CEZ Policy Calls for Modernized Coal, Nuclear Plants

AU1310081994 Prague MLADA FRONTA DNES
in Czech 6 Oct 94 p 12

[Article by Vaclav Vanek, CEZ power generating works employee: "CEZ: All Power Resources Must Be Utilized"]

[FBIS Translated Text] World experts from the field of power generation are convinced that it is necessary to utilize all available sources of electric power, and include among them measures aimed at the reduction of the consumption. The CEZ (Czech Power Generating Works) is applying the same approach. So far, none of the existing major sources of electric power can be substituted.

As is the case in the world, most of the electric power in the Czech Republic is generated in thermal power plants. It was 76 percent of the total in the Czech Republic last year (the global average is two thirds). Nuclear power plants supplied 21.4 percent of all electric power generated in the Czech Republic (17 percent globally) and hydroelectric resources 2.5 percent (about 20 percent globally). World statistics also include geothermal power plants, whose share amounts to approximately 0.3 percent. Other renewable resources (solar, wind power, and biomass burning power plants) do not yet yield significant amounts of power. The situation is not likely to change within the next 20 or 30 years.

The most important source of electric power—the thermal power plants—generate gases, however, that contribute to the production of acid rain and the greenhouse effect. To mitigate the impact, the advanced countries no longer permit the construction of thermal power plants without cleaning equipment. Another new trend is the application of more efficient technologies, including gas and steam-gas cycles, combined electric power and heat generation in heating plants, "clean coal" technology (in which harmful elements have been removed prior to burning), and fluid combustion. Power generating companies around the world also finance power conservation measures by their consumers, thanks to which they can postpone the construction of new nuclear power plants.

In the Czech Republic, the anti-air pollution act predetermines the next steps in power-generating industry. According to this law, the power plants must satisfy very strict environmental limits by 1998, at the latest. The CEZ is convinced that the best way of satisfying the requirements of this law is to complete the construction of two units of the Temelin [southern Bohemia] nuclear power plant, to desulfurize most thermal power plants, and replace the existing low-performance units with fluid combustion ones.

Nevertheless, the CEZ also pays attention to alternative power sources, which are capable at present of meeting the demand for electric power only partially. The company has been funding the development and a test run of a wind-power plant in northern Bohemia, and a project on utilization of the biogas from communal waste dump in Chabarovice [northern Bohemia]. It has also financed studies on the use of the fast growing technical plants (willow has proved itself in Britain) and biogases from substances such as waste wood and straw in the generation of electric power and heat. The CEZ already contributed to its customers purchasing 110,000 power-saving compact fluorescent light bulbs that require 80 percent less power. In addition, it has been regularly preparing analyses of the efficiency of electric appliances (e.g. washers, fridges) and making the results public. The CEZ also finances audits aimed at the conservation of energy in schools, for instance, or industrial facilities.

It can be expected that, in the advanced countries, the overall consumption of the primary power sources (coal, oil, gas) will not increase significantly, and it may even decline. In the instance of electric power, experts on the contrary predict global demand to increase gradually because both households and industry use it more and more all the time. Apparently it cannot be expected that the present resources will be complemented or partially replaced with thermonuclear power generated by a light nuclei (hydrogen, for instance) fusion before sometime in 2020-2030. In the just as distant future, solar power could also play a more significant role, if a much more effective form of its transformation into electric power can be developed.

Power consumption in the Czech Republic has dropped recently as a result of the decline in industrial production, but is beginning to rise again. This demand cannot be satisfied otherwise but by using modernized and modern thermal and nuclear power plants.

ROMANIA

Excessive Mercury Concentration Found in Drinking Water

AU1710094794 Bucharest ADEVARUL in Romanian
12 Oct 94 p 1

[MEDIAFAX report: "Drinking Water Contains Mercury and Other Toxic Substances"]

[FBIS Translated Text] In the September-October period, the Office in Charge of Consumer Protection [OPC] checked the quality of drinking water supplied to citizens in 40 counties. A particular case was discovered in Bucharest Municipality, where, in the past few months, the concentration of mercury, a very toxic substance, in the drinking water exceeded 10-fold the accepted amount. A sustained consumption of drinking water containing a high degree of mercury can slowly afflict the body and, in particular, can lead to liver and kidney disorders.

REGIONAL AFFAIRS

Southern Cone Environmental Issues

PY0710225694

[FBIS Editorial Report] The following is a compilation of reports on environmental issues monitored through 4 October:

Argentina

Patagonia residents are concerned over the quick desertification of the region. Studies show that more than 30 percent of the 700,000-sq km territory is seriously affected by erosion. Even the highly productive places such as the small valleys are damaged. The National Institute of Agricultural Technology and the German cooperation agency GTZ have warned that unless immediate action is taken, the Patagonia will become one of the huge deserts of the planet before the end of this century. It should be recalled that there were 22 million sheep in the Patagonia by 1957. This number dropped by 50 percent 40 years later, and 200 of the 800 surveyed farms already have been abandoned. (Buenos Aires LA NACION in Spanish 2 Oct 94 p 8)

Bolivia

Residents of the Franz Tamayo and Bautista Saavedra provinces, La Paz Department, will become responsible for the administration and preservation of the Ulla Ulla national reserve. On 12 September the Sustained Development Ministry, the Canadian Center for Studies and International Cooperation, and the Tupac Katari Peasant Workers Federation signed an agreement designed to preserve the reserve. It will become the first reserve to be administered by the population living in its jurisdiction. The agreement will be implemented in the other reserves that make up the National Protected Areas System. The Ulla Ulla Reserve has approximately 240,000 hectares, and more than 80 species of animals live there. (La Paz PRESENCIA in Spanish 13 Sep 94 p 8)

Mario Ramirez Arce, an expert from Potosi Department, said that a check made in Tarija, Potosi, and Chuquisaca departments showed that more than 50 mines in Potosi Department are contaminating the Pilcomayo River. Prosecutor General of the Republic Oscar Crespo Soliz also toured the area and said that the pollution of the Pilcomayo River has become a huge international natural disaster. (Santa Cruz EL MUNDO in Spanish 20 Sep 94 National Section p 1)

Brazil

The Sao Paulo Iron and Steel Company, COSIPA, and 10 other industries of the Cubatao petrochemical center had to halt a considerable part of their operations because of high air pollution, which reached 415 micrograms of particles per cubic meter of air. The break in operations began at 0100 on 7 September and

ended at 0600 on 8 September. The Sao Paulo environmental preservation agency ordered the discontinuation of the operation of machines and equipment that produce pollutants in a concentration above the level permitted by law. In addition to COSIPA, the following enterprises halted their operations: Manah, Ultrafertil, Adubos Trevo, Copebras, Gespa, IAP, Sol-orrigo, Sobre-Sobfemetal, Liquid Quimica, and Votorantim. (Sao Paulo GAZETA MERCANTIL in Portuguese 9 Sep 94 p 14)

Brazil has signed a non refundable loan agreement with the World Bank to finance a project for the preservation of Brazilian tropical forests. The purpose of the project is to increase technological and scientific knowledge of the Amazon region. The agreement involves \$15 million donated by the United States and the United Kingdom. Research projects will be aimed at the use of the land and water resources of the region, as well as to establish the potential value of tropical products. According to Environment Minister Henrique Cavalcanti, the project will not solve all the problems of the Amazon region, but it will mark a beginning. (Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT 22 Sep 94)

The government will invest 4.4 million reais [R] for recovery and preservation of Atlantic zone forests in Sao Paulo, Parana, Santa Catarina, and Espirito Santo.

The funds will be provided by the National Environment Program, through addenda to agreements signed by the Environment Ministry and state governments. The addenda will be signed on 29 September during a National Environment Council meeting. (Brasilia Voz do Brasil in Portuguese 2200 GMT 28 Sep 94)

More than 300 Caiapo Indians in the southern part of Para State are contaminated with the mercury used by gold prospectors. This conclusion is included in a survey carried out by professors of Brasilia University, Campinas State University, and Sao Paulo State University. The contamination levels surpassed the limits permitted by the WHO. The professors said that the mercury already affected their bodies, which could have entered the phase of destruction. They also concluded that gold prospectors are being contaminated through the air, and the Indians through the food, mainly fish. (Sao Paulo O ESTADO DE SAO PAULO in Portuguese 4 Oct 94 p A10)

Peru

Andres Castro, National Service for Agricultural Health director, on 22 September reported that the 1993 agricultural campaign registered damages worth \$70 million because of the destruction caused by plagues. He said that cotton plantations were the most seriously affected, and that plagues caused considerable damage in previous years. (Lima EL COMERCIO in Spanish 23 Sep 94 p A15)

Central American Delegations Define Miami Summit Position

PA1210223594 Managua Sistema Nacional de Television Network in Spanish 0200 GMT 11 Oct 94

[From the "National Newscast"]

[FBIS Translated Text] Central American and U.S. delegations [words indistinct] today presented their positions on the upcoming hemispheric summit in Miami. The central issue was definitely trade.

The Central Americans today established their basic documents for the Ecological Summit and for the upcoming hemispheric summit. At today's meeting, positions were set out on what U.S. policy should be toward the isthmus.

The Central Americans brought up trade issues as these will be the central points they will bring to the hemispheric summit. Everything was clearly presented to the U.S. delegation.

Although the Central Americans will discuss ecological issues in the coming days, these issues cannot be considered unless they have the necessary support.

[Begin Nicaraguan Deputy Foreign Minister Jose Pallais recording, in progress]...and the need at this summit for the United States to announce or define a general strategy or policy for a free trade agreement; that is, the integration of the entire hemisphere. Expectations are that the United States will do so, and this afternoon that intention was stressed. [end recording]

It appears that the Central Americans' demand had a bearing on U.S. policy.

[Begin Charles Gillespie, general coordinator of the Ibero-American Summit, recording] We are thinking about how to draw up an agreement for the economic integration of the hemisphere. That is the summit's challenge. If the presidents and leaders of the hemisphere can reach an agreement on how to achieve that goal, it would be a wonderful achievement. [end recording]

He also referred to the ecological issue, stating that one must consider not only how we will eat today, but how future generations will do so.

Nicaraguan President Chamorro Opens Ecological Summit

PA1210215394 Managua Radio Nicaragua Network in Spanish 1825 GMT 12 Oct 94

[Speech by Nicaraguan President Violeta Chamorro opening the Central American Ecological Summit for Sustained Development, at the Olof Palme Convention Center in Managua on 12 October—recorded]

[FBIS Translated Text] I want to cordially welcome you to this first ecological summit on Central American soil. This is the first time chiefs of state are meeting to take on

this issue, which is so important for future Central American generations. Some years ago, Central America went through the worst crisis of its history. It was burdened by conflicts and division. Now we have a new Central America where democratic values are shared by people who believe in the same objectives of peace, reconciliation, and respect for the will of the people freely expressed in the polls.

We are building the foundation for a new era of regional integration and well-being. We aspire to consolidate achievements secured during our peace and democratization processes so we can direct all our efforts toward sustained development to improve the standard of living of the Central American people and safeguard our natural resources.

In celebrating this ecological summit, we must not forget that Central America is the center of the American continent. It unites North and South, the Pacific and Atlantic. We have been a point of unity and amalgamation for many races and cultures. This has been our geographic, historic, and human destiny from the moment two continents and two worlds found each other five centuries ago on a day we commemorate today, 12 October.

We have adopted the feathered serpent as a symbol of this ecological summit. This serpent has been the object of cults and the worship of our ancestors throughout Central America. We Nicaraguans found this symbol in Asososca Lake, a few kilometers from here. It has withstood rain, wind, earthquakes, and volcanic eruptions. It is a testimony to the resistance and nobility of our people in the face of adversity. This symbol was discovered in 1850 by (Snyder), a U.S. explorer.

We are meeting with the conviction that Central America's environment, one of the richest and most diverse in the world, must have a rebirth, yield fruit, be free, and support sustained development, which we want to again proclaim as a goal of our government and as a good objective for the entire region. We are seeking a definite option that may lead the countries of the region to improved economic well-being, a more honorable way of living, lasting peace, and the consolidation of democracy from Peten to Darien. In this way alone can we give our children a prosperous Central America on the eve of the 21st Century. We Central Americans who live on these 500,000 square km of land trust and hope we will be able to join efforts to secure sustained development as the best option for solving the growing ecologic, economic, and social problems we face.

For this purpose, we Central Americans have decided to sign at this ecological summit in Nicaragua an historic alliance for sustained development that will mark a new path for the people of this region. We want to abandon ignorance, poverty, illness, and violence. We want to secure education, welfare, health, and safety with respect for individual rights and nature.

The future of this Central American alliance depends not only on our work but also on support from the international community. I appeal to countries and organizations to decidedly support this new model for sustained development which we Central Americans are today proudly offering the world.

Dear friends, 30 million Central Americans have many things in common to share. We are a single geographic region with abundant natural resources, the same geologic conditions, and the same climate. We are the cradle of great indigenous cultures. We form part of the same historic process.

In Central America, borders no longer separate us. On the contrary, nature unites us along our coastlines, mountains, lakes, and forests. Countless species make the diversity of our flora and fauna evident. It is present in the cays of the tropical sea that surrounds us and on the highest mountain tops.

We are a great family of 30 million brothers. We are the largest congregation of nations in the world proportionately speaking, considering the small geographic space we occupy on the continent. Indian, European, and African ethnic groups coexist here while safeguarding their cultures and practicing their traditional values. For the first time in the history of Central America, we are enjoying a reconciliation that has allowed us to leave behind fratricidal wars and disputes as well as dictatorial and totalitarian regimes. The representatives of the people have been democratically elected by the people.

Dear friends, this is an historic moment for the region. We are going to give the world new evidence of our determination and turn Central America into a model of sustainable development. The governments and civilian society will share responsibilities so we may hand down to future generations a revitalized and prosperous Central America. We Central Americans have two big tasks ahead of us: to improve land production by means of a rational and sustainable handling of our natural resources, and to continuously care for our environment, with all its potential for biodiversity, upon which the life and survival of our people depends to a great extent. As citizens of this planet, as owners of 10 percent of the world's biologic wealth, as a people who trust in God, love freedom, and want order, peace, and progress, we want a better future for our nations and the world. Thank you.

Salvadoran President Arrives for Ecology Summit

*PA1210164994 Managua Radio Nicaragua Network
in Spanish 1539 GMT 12 Oct 94*

[Interview with Salvadoran President Armando Calderon Sol by unidentified reports upon arrival at Managua International Airport—live relay]

[FBIS Translated Text]

Calderon Sol: It is a pleasure to be here in Nicaragua to participate in the Central American Ecology Summit, which will serve to bolster Central American integration, especially now as we discuss this proposal for an alliance for sustained development throughout the region.

We have come to work for the future of our children, to safeguard our environment, and to think about how to resolve ecological problems, the issue on which this summit will put emphasis.

This summit is a most important one. For me, it is a source of much satisfaction to be here and to see Central America, which is improving daily and consolidating democracy and peace. I am now at your disposal.

Reporter: [Words indistinct]

Calderon Sol: We will discuss various issues, and that one could apparently also be discussed during the summit, and Central America, the countries of Central America, could be represented in Haiti. We have said El Salvador is prepared to cooperate in the humanitarian phase. We have technology for reconstruction works. We have carried out several social programs in El Salvador and implemented reconstruction programs at the national level. We could offer to Haiti this assistance, this acquired technology by Salvadoran technicians.

Reporter: [Words indistinct]

Calderon Sol: We know that U.S. Vice President Al Gore will come. For the Salvadorans, I, as president of El Salvador, will broach an important issue, such as the request to extend the stay of the Salvadorans in the United States. I will request this extension. We have already requested it. We will discuss this matter with Vice President Al Gore. We will also discuss trade issues. Trade with the United States is an issue most important for Central America as a whole and for El Salvador.

Reporter: [Words indistinct]

Calderon Sol: We are searching for that. Central America wants parity with NAFTA. We believe Central America is a most important geopolitical region that cannot be at a disadvantage in relation to Mexico in the field of investments being waged by all the Central American countries and the entire region.

Foreign Minister Cited on Topics of Ecology Summit

*PA1110202494 Managua Radio Nicaragua Network
in Spanish 1200 GMT 11 Oct 94*

[From the "News 2,000" newscast]

[FBIS Translated Text] Foreign Minister Ernesto Leal has said at a news conference the main topics of the Central American Ecology Summit concern economic and political aspects. The topic of investment has been of great importance for the isthmus or for those countries that want to sign a free trade agreement with the United

States. This issue requires, however, a transition period that will permit a reshaping of existent productive structures in the region.

A meeting of delegates will be held today to analyze the proposed, sustained developmental policy and the possibility of signing a Central American alliance agreement for sustained development.

As part of the resolutions of the first summit on the ecology, it is expected the regional presidents will sign a declaration and endorse the Masaya Volcano Action Plan.

Costa Rica's Figueres Defines Sustainable Development

PA1410203194 Mexico City NOTIMEX in Spanish
0414 GMT 12 Oct 94

[FBIS Translated Text] Managua, 12 Oct (NOTIMEX)—Costa Rican President Jose Maria Figueres asked the international community today to collaborate with Central America in carrying out projects of sustainable development in the region.

The head of state offered to the international community to be the region's partner in the Central American sustainable development, which, he maintained, means "learning together and taking advantage of the positive and not positive experiences."

He made this statement as he defined the Alliance for Sustainable Development, signed by the regional six heads of state during the Central American Ecological Summit, which opened in Managua today.

"This joining of efforts allows a fair and equitable distribution of the economic benefits and their use among the attending countries and governments," Figueres said as he explained how to support the Central American efforts.

The Costa Rican ruler added Central America's friendly countries could implement programs aimed at taking advantage of the region's biodiversity in a more intelligent fashion.

Another mechanism of support could be the contributions to the Central American Sustainable Development Fund [Fondo Centroamericano para el Desarrollo Sostenible] by several international organizations to finance projects that will help promote this new development model in all its phases, he said.

Figueres also asked for access to the markets for Central American products, adding: "We want an opportunity to compete allowing us to attract investments to our countries and to complement our savings. In addition, we want an opportunity facilitating a significant technological transfer, which would jump start our production capability."

These points will be consistent with the changes that took place in recent years and with the rhetorics we have heard during these times of open and interconnected markets, Figueres said.

The Costa Rican president also requested foreign cooperation to establish indicators measuring the progress made while taking care of the environment and natural resources and to be aware of "how we are accomplishing the task of truly and effectively incorporating civilian society" into this process.

Presidents Sign 'Alliance for Sustainable Development'

PA1410203094 Panama City ACAN in Spanish
2008 GMT 12 Oct 94

[FBIS Translated Excerpt] Managua, 12 Oct (ACAN - EFE)—The Central American presidents would like to implant a "new ecological order" in their region so as to guarantee, without renouncing development, the survival of the symbolic quetzal, the harpy eagle, which is the largest existing bird, and tens of other species in danger of extinction and to prevent the disappearance of their tropical forests.

Democracy, stability, economic growth, and the disappearance of poverty in Central America hinge on the survival of its natural resources, which have suffered irreversible damage in the past decades.

This is the chief message the area presidents are sending today with the signing of the "Alliance for Sustainable Development" declaration, with which they seek to secure economic growth in harmony with the protection of the environment.

The declaration is the most important document the heads of state are signing today during the first "Ecological Summit" being held in Managua, attended by U.S. Vice President Albert Gore and OAS Secretary General Cesar Gaviria.

Nicaraguan President Violeta Chamorro; Guatemalan President Ramiro De Leon Carpio; Honduran President Carlos Roberto Reina; Salvadoran President Armando Calderon Sol; Costa Rican President Jose Maria Figueres; and Panamanian President Ernesto Perez Balladares are attending the meeting. Belizean Prime Minister Manuel Esquivel did not come but sent Henry Young, tourism and environment minister, as his representatives. [passage omitted]

BOLIVIA

Accord Reached With Peruvian Military on Preserving Amazon

PY1410222094 La Paz PRESENCIA in Spanish
27 Sep 94 p 7

[FBIS Translated Text] General Moises Shiriqui, Bolivian Armed Forces General Staff chief [position

held prior to his resignation on 4 October], stated yesterday that the third round of talks between the top military commands of Peru and Bolivia, which concluded on Friday, 23 September, reached a decision on working for the preservation of the Amazon.

He said that all members of the top military commands from the two countries expressed their concern over the indiscriminate cutting of trees and the pollution of jungle regions by timber and mining companies and by the action of drug traffickers.

According to the explanation of Gen. Shiriqui, who headed the Bolivian military delegation to the meeting, the work to preserve the environment is not only the responsibility of the institutions in charge of its control, but encompasses other organizations as well, such as the Armed Forces, which have specialized units deployed along the Amazon region. "All participants have also agreed to implement plans and programs intended to provide humanitarian assistance to rural border regions between Bolivia and Peru, namely, in the zones near Lake Titicaca," Gen. Shiriqui explained.

He explained further that the meeting has served to ratify the desire to exchange officers and cadets of the two countries' Armed Forces so as to enhance their professional abilities.

He added that this experience has allowed them to learn about the progress achieved by Peruvian military personnel in the fight against subversion, an evil which has been adversely affecting Peru for more than a decade.

"The government, the Armed Forces, and the Peruvian police are succeeding in pacifying that nation with a firm fight against terrorism, because that task has the support of the Peruvian people," the general said in answer to a question.

Nevertheless, Gen. Shiriqui said that on Friday [23 September], during the return flight from Trujillo to Lima, the plane aboard which he and seven other Bolivian officers who attended the third round of talks were traveling could not land at the airport because of a presumed terrorist attack.

He said that this emergency situation forced the plane to land in the city of Pisco, 30 km from Lima, while the Peruvian police were defusing the bomb.

Despite the coincidence of the planting of the bomb and the landing of an airplane that was carrying the Bolivian officers, the Peruvian police were unable to confirm the objectives of the frustrated terrorist attack.

COLOMBIA

Poppy Cultivation Causing Deforestation

94WD0580Z Santa Fe de Bogota EL TIEMPO
in Spanish 27 Aug 94 p 16B

[Article by Jorge Parga V.]

[FBIS Translated Text] Neiva—Within two years, 50 percent of Neiva will be without water, unless a new impounding system for the waterworks is constructed before 1996. This is needed to solve the shortage in supply due to the depletion of its water sources.

The problem stems from the deforestation caused by the poppy cultivation in the Las Ceibas River upper basin, the felling of woods, and the deterioration of the distribution system built over 30 years ago.

The consequences of these factors are reflected in the high sedimentation rate recorded in the river during the past 10 years, especially during the 1989 floods, when it registered nearly 172,200 tons.

This situation has caused the tributary to lose its volume of flow increasingly, to the point of dropping to 1.9 cubic meters per second during the summer season: almost equalling the present consumption, which is 1,100 cubic liters per second.

Based on the projections for demographic growth in the town, which currently has 248,000 inhabitants, the consumption during the next 25 years will be 1.7 cubic meters per second. This demands that new supply systems be identified now.

For this purpose, the Public Enterprises Agency has studied various alternatives, considering as the most viable the diversion of a cubic meter from the Balsillas River to the La Plata stream which, in turn, is a tributary of the Las Ceibas River.

Other investigators propose the construction of dikes in the upper part of the Las Ceibas, to store a million cubic meters for use during the summer season.

With regard to the first alternative, the pluviometric variations make it possible to ensure that average increase in volume of flow, because the rainy season in that part of the cordillera occurs opposite the summer season in Neiva.

The New Waterworks

The cost of optimizing the waterworks, including an expansion of systems and treatment plants, is calculated at 6.3 billion pesos.

The project includes the upper and eastern portions of the town, which are supplied with 200 cubic liters per second by the pumping system.

The studies and designs, made by the consortium CRA Limited-Mauricio Sanclemente, are ready for presentation to the national government. Their aim is to increase the production capacity by 500 liters per second starting in 1997.

According to the manager of Public Enterprises, Jaime Sanchez Reyes, the present losses are nearly 40 percent. They are attributed to leakage due to defective conditions in the system and the misuse of water by consumers.

This has forced the entity to propose the expansion of the distribution system over the short term, to avoid drastic rationing.

Currently, about 30,000 inhabitants of the eastern area are faced with limits in service, because the storage tanks do not allow for an accumulation of the volume required to meet the demand at peak hours.

The new waterworks has been designed for 30 years of service: that is, until the year 2025, when Neiva's population will be close to 500,000 inhabitants.

The new impounding system will be constructed 60 meters above the Guayabo bridge, over the Las Ceibas River, with an elevation of 663 meters above sea level.

All the candidates for mayor in Neiva have as a priority in their government programs a solution to the water problem confronting the town, within the next three years.

The restrictions now occurring in this service have begun curtailing the town's urban development. During the first quarter of 1994, the construction sector recorded a 3.4 percent decline.

PERU

Report Claims Deadly DEA Spray Destroying Fruit Plantations

PY1710231094 Lima LA REPUBLICA in Spanish
28 Sep 94 p 15

[Article by Rousseau Paredes]

[FBIS Translated Excerpt] Pucallpa, 27 Sep—The U.S. Drug Enforcement Agency (DEA) has destroyed dozens of hectares of lemon verbena, banana, yucca, and papaya plantations in Nueva Requena district by spraying coca plantations with the deadly fungus "spike," which destroys all forms of vegetal life within a radius of several kilometers.

This report has been released by the "Santa Clara" Committee of Agrarian and Agro-Industrial Producers and Traders, who demanded immediate intervention by the government to stop the annihilation of fruit plantations, which is causing great losses to the country totaling several millions of new soles.

Juan Wenceslao Tantarico, president of the committee, said that the Ucayali National University has after thorough studies confirmed that since April 1994 the DEA has been using the deadly fungus "spike" for the eradication of coca plantations.

He said that this fungus has caused the destruction of 11 hectares of lemon verbena plantations alone, representing a loss of 30,000 new soles. [passage omitted]

REGIONAL AFFAIRS

Effects of Nuclear Blasts Detailed

94WN0413B Kiev ZELENYY SVIT (SPECIAL EDITION) in Russian Aug 94 pp 18-21

[Unattributed article: "The Advent of the Apocalypse"; special edition received 29 Aug 94; published between No. 9 and Nos. 10-11 1994]

[FBIS Translated Text] It is naive to think that, having eliminated its own nuclear weapons and shut itself off from the former fraternal republics, Ukraine has made itself safe from the "military" atom for all time. To it, borders do not exist.... From 1945 through 1978, 1,165 nuclear explosions were produced throughout the world. The contamination travels over great distances at a significant pace. It is no laughing matter that the Chinese exploded a nuclear bomb on 16 October 1980 and four days later the radioactive cloud covered North America. Sea currents are sluggish and they spread nuclear contamination over two to three months. Radionuclides accumulate in fish and marine organisms and stay on the sea bottom.

It is time to detonate the explosions—it is time to find out about them.

1954. Nuclear explosion at the secret southern Ural proving ground involving troops, equipment, and Marshal Zhukov.

So-called nuclear explosions for "peaceful purposes." There were 126 of them in the former USSR from 1965 through 1989. There were 17 in Yakutia, five in Bashkiria, 15 near Astrakhan, 27 in the Volga basin, 25 in Kazakhstan, one in the Donbass, eight in Perm Oblast, and eight in Orenburg Oblast. There were explosions in Chita Oblast, in Kama, near Kostroma, and in the Urals. In order to extract oil and gas and for seismic surveying purposes. And they thought they would turn the northern rivers toward the south. In 1971, on the proposed path of the "great turn"—the Pechora-Kolva Canal—three nuclear devices were exploded. And no kind of Chernobyl is needed—the instruments really squawk at these sites from the radiation.

Semipalatinsk Proving Ground It is two-thirds the size of the Crimean Peninsula. It operated from 1949 through 27 August 1991. There were 468 nuclear explosions (150 above-ground explosions prior to 1963). And let Colonel Petrusenko bathe first in the nuclear lakes—people do not want to live on this "glowing" land now. Incidentally, doctors have long concealed radiation-caused illnesses under the name "brucellosis."

But this, it seems, is not everything. For the military there was not enough room at the Semipalatinsk Proving Ground. Prior to 1990 there were 38 individual nuclear explosions of varying strengths in Kazakhstan at 27 sites—in the Urals and in Atyrau, Aktyubinsk, Akrolino, Mangistau, and Southern Kazakhstan Oblasts—nuclear

weapons were being tested. Radiation is still "leaking" out of the caverns that were formed.

Proving ground on Novaya Zemlya It was in operation from 1955 through October 1991. There were 132 explosions (87 in the atmosphere, three underwater, and 42 underground). In 1958 there were 26 explosions in the atmosphere and underwater. The most powerful explosion, 58 megatons, occurred on 30 October 1961. Before the test the residents of Novaya Zemlya were driven from their homes to the stadium: "Warning, rocks will be mined in the quarry!" Although everyone had known for a long time what kind of "rocks" were being mined.

Because of the nuclear crimes on Novaya Zemlya, cancer is encountered among the northern peoples twice as often as the average in the USSR. In the bodies of reindeer herders strontium-90 is higher than the norm by a factor of 20-40. In the summer of 1990 Greenpeace activists landed on Novaya Zemlya. Their radiometers immediately went right off the scale.

As of 1 July 1992 classified data about the Kyshtym tragedy in Chelyabinsk Oblast became known. Since 1949 the PO [Production Association] Mayak, near the settlement of Kyshtym near Chelyabinsk, had handled the burial (and as of 1976 also reprocessing at the radioactive chemicals plant) of spent nuclear fuel. Also of "mail boxes" from the AES's. Haste and a callous attitude toward the health of the people led to tragedies. Three of them were of a catastrophic nature.

The first lasted seven years. From 1949 through 1956 the PO Mayak poured liquid radioactive waste directly into the Techa River, which flows into the Iset River and from there into the Tobol River and Arctic Ocean. Over the seven years the criminals managed to dump waste with a total radioactivity of 2.75 million curies. And it was only after the pestilence had sickened people living in the vicinity that they began to bury the liquid waste. For example, in the lakes. In Lake Karachay 120 million curies of radioactivity accumulated and 7,562 people who had received from 3.5 to 170 rems were moved. The rest (doses ranging from 3.5 to 16 rems), not knowing any better, lived right next to Mayak.

The second catastrophe occurred on 29 September 1957 as a result of a chemical explosion in the radioactive waste storage site. An atomic mushroom sprouted. The sky in all directions shone with a red color. Later the newspaper URALSKIY RABOCHIY wrote that this was the Aurora Borealis. The explosion spewed out 20 million curies. A large concrete covering held back a large portion, but 2 million curies spilled across Chelyabinsk, Sverdlovsk, and Tyumen Oblasts. The total area was 23,000 square kilometers, where a quarter of a million people lived.

The third catastrophe occurred in the spring of 1968. Lake Karachay began to dry up and the wind carried a mass of radioactive dust away from its dried-up shores. The developers of nuclear weapons were basking in the

praise while the test participants and local residents were dying. Just Lake Karachay alone held more than the entire Chernobyl area.

But especially astounding were the "measures" for protecting the population from radiation. Along the river they placed posts with barbed wire and signs saying no swimming. In a very contaminated region, the village of Muslyumovo, a pool for the children was built so that they would not go swimming in the river. But there was never any water in the pool.

Still unknown is the total number of irradiated people. A list was compiled of residents moved from the flood plain of the Techa River, but similar lists were no longer compiled during the subsequent situations of 1957 and 1968.

Another fact about the "nuclear environmental" crimes of the military has also become known. On 14 September 1954, during military exercises under the command of Marshal Zhukov, USSR Defense Minister Bulganin, and his deputy, Marshal Vasilevskiy, in which more than 200,000 soldiers and officers participated, an atomic bomb was exploded in the area of Totskoye Station in Orenburg Oblast at 0933 hours at an altitude of 350 meters. There is still a high rate of cancer-related illnesses in this region.

The deliberate irradiation of people during nuclear weapons testing began in our country back in 1949, when, at the Semipalatinsk Proving Ground, aircraft which had deliberately been assigned the task of measuring the radiation began flying above the epicenters of nuclear explosions. On 12 August 1953, pilot Boris Korniyakov became the world's first pilot to fly at an altitude of several meters above an epicenter after the explosion of a hydrogen bomb. And four years later Korniyakov conducted radiation measurements after 40 (!) bombs had been exploded.

On Novaya Zemlya the same type of work was carried out by a special air force unit under the command of Hero of the Soviet Union Masayevich.

Let us add to this the "dirty" production at a uranium-enrichment plant in Aktau and the escape of radioactivity on the Kola Peninsula, 50 km from the Norwegian border, and in the coastal settlement of Shtokovo-22 at the navy bases.

In Kazakhstan, in the sands of Adgir and Taysongan, where the missiles are launched, there is a high rate of infant mortality and allergy-related illnesses. In a third of the wells the water is unfit for drinking. The escape of radiation from the many underground caverns formed after the tests has been noted. Almost all steppe antelopes caught in these areas are blind.

But the "playing" with the atom is continuing. In November 1991 the Soviet military brought nuclear

waste from Iraq, landing its aircraft with the nuclear "stuffing" for a stopover at Sheremetyevo-2. Without any precautions.

As a correspondent of the independent St. Petersburg newspaper CHAS PIK, Viktor Tereshkin, recounted, there are two half-deserted but previously secret installations in the suburbs of St. Petersburg, where a new nuclear weapon was being produced—radioactive aerosols. Beriia himself monitored the work. In one of the installations the beta radiation amounts to 50,000 particles per minute from one square centimeter. More than 300 associates of these military "spots" have already died from radiation exposure.

Just how many similar fragments of evil are scattered across the entire territory of the former USSR!?

Kapustin Yar is an enormous proving ground of 1.5 million hectares at the boundaries of Ural and Guryev Oblasts. Remnants of spaceships and downed aircraft are strewn all around. Sometimes falling missiles fall into the flocks of sheep. Cattle drink water from craters and later die from the peculiar "Guryev malady." In 1961 massive fires blazed on the steppe. Since then nothing has grown on 15,000 hectares. Local residents, through ignorance, are using missile parts in their homes, slowly but surely being irradiated by them. The meat of the sheep of many flocks has been contaminated by the atom.

And oh, the radiation "sown" by the various "mail boxes!" As the previously secret special records of the Ukrainian SSR Council of Ministers show, at the Kiev plant Arsenal radioactive waste was simply burned outside.... "Mail box" No. 115 of the Kharkov National Economic Council irradiated in 1960 not only workers but also members of their families. All this forced the Ukrainian Government to adopt several secret decrees on improving burial of the "military atom."

The Barents and Kara Seas—Since 1964, in violation of the International Convention on Prevention of Pollution of the Seas, the Murmansk Steamship Line was engaged in the criminal secret burial of nuclear waste at a shallow depth. The steamships Lapse and Volodarskiy and the tanker Serebryanka delivered 11,000 containers to the spot. Those that did not want to sink were shot at from cannons. Debris is still strewn along the shores. In 1984 near Novaya Zemlya a container with a radiation level of 160 roentgen per hour was caught in a net. They cleaned it off a bit—and put it back in the water. But the most unpleasant thing is the fact that, somewhere close to Novaya Zemlya, the reactor from the nuclear icebreaker Lenin is still lying around, possibly not alone. Permission for this crime was given by secret Decree No. 148-62 of the USSR Council of Ministers of 18 February 1967. Solid radioactive waste, as a rule, was dumped in the Kara Sea (in the following manner: two small holes were made in the container, which filled with water and sank to the bottom), while liquid waste was poured into the Barents Sea and, as a rule, where fish were caught most often.

According to certain data, around 200,000 cubic meters of radioactive liquid waste were buried in the Barents Sea, at five spots, at a depth ranging from 20 to 60 meters, from 1959 through 1991, and 32,000 cubic meters of solid radioactive waste were buried at eight spots in the Kara Sea. Seven nuclear reactors were sunk in the Kara Sea: six prior to the 1972 London Convention taking effect and one afterwards. Russian officials have asserted that there are no such reactors in the Barents Sea. According to foreign sources, from 1960 through 1991 the USSR scuttled 21 nuclear reactors on the bottom of the Arctic seas, including the Barents Sea. As a result, radioactivity in the Barents Sea increased to 12,900 curies, in the Kara Sea, to 28,800 curies.

According to other data, during the years 1959-1962 the USSR dumped into the northern seas liquid radioactive waste with a total radioactivity of around 20,600 curies and solid radioactive waste with a total radioactivity of around 2.3 million curies. In the seas of the Far East these figures amounted to 12,300 and 6,200 curies respectively. In all the USSR has sunk in the seas 12 reactors without nuclear fuel (including three in the Far East) and seven under emergency conditions with nuclear fuel still in them (all in the north). During the years 1986-1989 leaks occurred from nuclear fuel depots from a base on the shore of Andreyev Inlet into the Lizafiora and the Kola Peninsula's Motovskiy Bay.

We must not forget about the naval beacons and the countless other nuclear-powered military objects. Who has measured the background around them?

The calculated theoretical probability of a tragedy at an AES was equal to one instance in a million years, but Chernobyl happened all the same! Where is the guarantee that, because of problems in communications between strategic installations, a collision of the earth with a dust cloud or a UFO could not cause a "retaliatory" nuclear strike? A rifle, so they say, will discharge on its own once in a hundred years.... Or for purely internal political reasons. After all, it is known that in the USSR there were three briefcases with the electronic codes for launching strategic nuclear weapons (DIALOG No 17, 1991). During the August coup one briefcase was with Gorbachev in the Kremlin, the second was with a coup leader, Defense Minister Yazov, and the third was with his chief of the General Staff, Moiseyev, who supported the coup. Two against one.... After 18 August, Gorbachev's "nuclear briefcase disappeared, together with the duty officer.

It is naive to think that by renouncing nuclear weapons and closing the AES's we will make ourselves safe from the "military" atom. In the fifties through the seventies, Professor A. Marse's radiological group worked in Polelsye. Its conclusions are inconsolable: radiation had damaged the homeland of Ukrainian and Belarusian farmers. The scientists established that by the sixties (a quarter of a century before Chernobyl!) contamination of the milk of farm cows by cesium-137 exceeded the average value

by a factor of 50 (!), while cattle meat had been contaminated by a factor four times higher. Mushrooms, fish, and game also "glowed." It is interesting that the configuration of the radioactive spot looked the same as that after the Chernobyl explosion. But there are no preventive measures. People knew nothing about the scientists' research....

Perhaps the guilty party is the secret Belarusian installation near Limen, at the Cherikov Proving Ground. According to data of the Belarusian newspaper NABAT, back in the fifties and sixties tests of nuclear shells and weapons were conducted there.

Or another example—the nuclear explosion for peaceful purposes on 16 October 1978 at the Yunkiy Mine in Yenakiyevo. Specialists from the Moscow Mining Institute imeni A. Skochinskiy and the secret atomic city of Arzamas-16, having decided to check scientific hypotheses, and generals from the USSR Ministry of Defense buried a nuclear present equivalent to 333 metric tons of trinitrotoluene at a depth of 1 km and blew it up. The residents of the town of Yunokomunarsk, under which the mine lay, as well as the miners themselves were evacuated for a day. At the time of the explosion the portrait of Lenin in the office of the mine's party organization fell down. Then, not knowing any better, the coal miners went back to the coal-face. Now, according to the data of the local clinic, there are dozens of radioactive spots in Yunokomunarsk.

A second nuclear explosion for peaceful purposes occurred in approximately 1975-1976, in Krasnograd Rayon of Kharkov Oblast, near the village of Krestishche. It was like this. A fire occurred at gas well No. 35. They were unable to extinguish it for half a year. Then the clever people from Ukraine's oil- and gas-extracting organizations came up with the idea of extinguishing the fire with the help of a nuclear explosion. They contacted the military and they quickly "fired one off" at a depth of 2.6 km. However, they did not kill the flames. Several months later the firemen and gas workers, under conditions of radioactive contamination, blew out the fire by shooting from a tank. Only in 1991 was a superficial environmental study done on the installation, which is 1.5 km from the village.

According to certain data, there were also nuclear explosions for peaceful purposes in Carpathia, as well as in 1947 in the mines of the settlement of Taromskoye (the Sukhacheva Railroad Station) near Dnepropetrovsk in order to select the critical mass for a nuclear device. In the fifties, according to certain data, a barge with a freight capacity of 1.5 million metric tons, loaded with uranium ore, sank in the Dnieper River within the precincts of Dnepropetrovsk. Many people received a serious dose of radiation during the operation of one of the blast furnaces of open-hearth shop No. 2 of the Dneprovskiy Metallurgical Plant in Dneprodzerzhinsk, where ore was melted, which had a high content of uranium to be used for military purposes.

In the city of Zheltyye Vody, Dnepropetrovsk Oblast, uranium ore is mined. There are piles of this ore—right in the center of the city. Some house foundations have been made from its tailings. In some places the instrument shows 640 microroentgen per hour.

In 1968 a satellite fell from the sky into the Volga River near Balakovo. For 20 years, not knowing any better, people have been drinking radioactive water. Because of an accident, a powerful outburst of radiation occurred on 6 April 1993 at a chemical combine of the closed military town of Tomsk-7.

For 70 years the USSR succeeded in giving birth to talents which it then satisfactorily buried. But the "military" atom is another matter.

The possession of nuclear weapons is criminal. Having declared its status as a nonnuclear power, Ukraine could turn to the UN with a proposal for the complete destruction of the "military atom." And it is necessary to begin with abolition of the privileged status of the nuclear states as permanent members of the UN Security Council.

Vorontsov Ponders Caspian Pollution Threat

95WN0001A Moscow LITERATURNAYA GAZETA
in Russian No 39, 28 Sep 94 p 10

[Article by Nikolay Vorontsov, State Duma deputy:
"The Sturgeon—More Hard Currency than Oil"]

[FBIS Translated Text] A contract was very solemnly signed in Baku with a Western consortium on the joint development of three Caspian oil fields.

I want to touch on this question not from an international and legal point of view, where special agreements concern internal reservoirs, which the Caspian is, but from the standpoint of ecology.

Along with very rich oil and gas resources (and they are located not only on territories adjacent to Azerbaijan, but also to Russia, Kazakhstan, and possibly to Turkmenistan), a no less valuable resource is the sturgeon fish population. Eighty percent (!) of the reserves of the sturgeon stock is concentrated in the Caspian. This is stellate sturgeon, sturgeon, white sturgeon, and sterlet sturgeon.

It must be said that the oil and gas resources, no matter how great, are nevertheless finite. Given a rational use of sturgeon resources, they are practically inexhaustible. It must be realized that sturgeon are to no less a degree hard currency than oil (if not to a greater degree). Here is an example. Americans have ascertained that in the last 100 years the catch of fish in Alaska brought several times more hard currency than gold.

Today, international control over the condition of the Caspian is needed. The unique basin requires unified management. I spoke more than once about this back in

the period of the existence of the Soviet Union when centrifugal trends were just beginning to appear.

I would like to present a short digression into the fish kingdom. All Caspian sturgeon, with the exception of the sterlet sturgeon, which propagates in rivers, grow up in the Caspian, but they go to rivers to spawn (the basins of the Volga, Ural, Terek, Kura, and other rivers). The largest was the Volga stock, whose number has dropped sharply in connection with the construction of the cascade of stations of the Volga GES [hydroelectric power station]. But fodder resources were released in the Caspian. And as a result of the fact that neither Russia nor Kazakhstan built one dam (thank God!) on the Ural River, the stock in the Ural basin began to increase. But the Kura River, because of the construction of the Mingechaur GES in Azerbaijan, also saw a noticeable decrease in the fish population.

But the reason for the decrease in numbers is due not only to the construction of hydroelectric power stations that obstruct the course of the river, but also to uncontrolled poaching. But any catch of sturgeon in the Caspian is the destruction of the fish brood; that is, poaching. If you go along the shores in Azerbaijan and Dagestan, and also the shores of Astrakhan Oblast, you will see traces everywhere of monstrous poaching: The shores are littered with scales and the chopped off heads of sturgeon.

But the other reason for the decreased fish population is the pollution of the Caspian by various impurities. Moreover, not only by petroleum products. Because of the primitive production of soda with the use of mercury, for example, the Volga discharges mercury. We also know that a whole series of poisonous organic compounds enter the Volga. All of this leads to a sharp reduction in the sturgeon stock.

I think that here on the territory of the former Soviet Union there are only two such places where the biological resources are potentially much richer and more expensive than any mineral and geological resources. These are Kamchatka, which from the direction of the Sea of Okhotsk, the Pacific Ocean, and the Bering Sea, has a unique stock of Far Eastern salmon, and the Caspian Sea.

I have visited Neftyanne Kamni, which consists of a huge system of piers that go for tens of kilometers from Apsheron into the depth of the Caspian Sea. In the last dozen years, the sea has been very seriously polluted in the Baku area. I am not a specialist in the sphere of oil drilling technology, but I do not see the possibility today of guaranteeing the pumping of oil without losses as its volume is increased.

For the sturgeon, relatively clean water begins from 100 kilometers to the south from Apsheron, but I do not know where the border will move to as soon as the created consortium starts to operate. Moreover, the example of Azerbaijan will provide an incentive for

other countries as well: Enormous reserves of oil, and especially of gas, are located in the northern part of the Caspian, contiguous to Russia and Kazakhstan. And if the oilmen of these countries also start to compete, who will open up their resources more quickly, and what awaits nature?

The MFA [Ministry of Foreign Affairs] of Russia, as is known, launched a protest in connection with the signing in Baku of the "historic" contract. First, it seems to me, the protest is associated with the uncertain legal status of the Caspian, which, nonetheless, is not a sea, but an internal reservoir. Second, I am convinced that the MFA, for example, knows all about the existing international agreements of the former USSR and Iran on the protection and assignment of quotas on the sturgeon fish stock.

I will cite this example. When the centrifugal trend in the framework of the Union started, Turkmenistan tried to raise the question about its fishing within the borders, as they thought there, of its own economic zone in the Caspian Sea. We came out of this situation in a rather simple and natural way: We established a quota and a share of sturgeon that should be transferred to Turkmenistan from the catch in the Volga and the Ural so that Turkmenistan would not take fish brood in the Caspian Sea. This plan satisfied the Turkmen side at that time.

Then the Union came to an end, and with it also control over a unified ecological system of the Caspian Sea.

RUSSIA

Moscow on Unilateral Actions Regarding Caspian Sea

LD0810185894 Moscow: ITAR-TASS in English
1842 GMT 5 Oct 94

[By ITAR-TASS correspondent Boris Sitnikov]

[FBIS Transcribed Text] United Nations October 8 TASS—"Unilateral actions as regards the Caspian Sea are unlawful and will not be recognized by the Russian Federation," says a memorandum "the stand of the Russian Federation on the legal regime of the Caspian Sea" circulated here today as an official document of the United Nations General Assembly.

"The Caspian Sea which has no natural connection with the world ocean is a closed water pool. The norms of the international sea law cannot be applied to the Caspian Sea, including the provisions concerning territorial sea, exclusive economic zone and continental shelf. Thus, there are no grounds for unilateral claims on the establishment of similar spaces in the Caspian Sea, same as the introduction of elements of their regime," says the document.

It is noted that the legal regime of the Caspian Sea is envisaged by the provisions of the Soviet-Iranian Treaties of 1921 and 1940 and has not been changed. The

appearance of new Caspian nations requires the improvement of the legal regime with due account of preservation of the ecosystem of the unique water pool which has the world's only stock of Sturgeon.

In this connection the Russian Federation has submitted to consideration of all Caspian states a draft "agreement on preservation and use of bioresources of the Caspian Sea." The soonest conclusion of a "treaty on regional cooperation in the Caspian Sea" whose draft was developed by Iran is also very important.

"The Russian efforts to accelerate the conclusion of the aforesaid important treaties that correspond to the interests of all the Caspian states, unfortunately, encounters inertia that cannot be described other than an attempt to avoid the establishment of a new international-legal regime for the Caspian Sea. At the same time, some Caspian nations are holding unilateral actions, ignoring principles and norms of the international law, and trying to achieve unilateral benefits to the prejudice of rights and interests of other Caspian nations," says the document.

In this connection, Russia has informed the United Nations General Assembly that it "reserves the right to take necessary measures at a time it considers best to restore the broken order and eliminate the consequences of unilateral actions".

Russia has warned that "all the responsibility in these cases, including possible material damage, will rest on those taking unilateral actions and showing their contempt for the nature of the Caspian Sea and obligations on international treaties".

Fears of Russian Disposal of Foreign Waste Products

94WN0425A Moscow: NOVOYE VREMYA in Russian
No 38, Sep 94 (signed to press 20 Sep 94) pp 32-34

[Article by Andrey Bayduzhiy: "Will Russia Become the World's Garbage Dump?"]

[FBIS Translated Text] Each year Russia produces 7 billion tonnes of industrial waste, and now attempts are being made to bring several more million tonnes here from abroad.

If we had to choose the main features of this past century, in addition to listing the two world wars, the rise and fall of real communism, the discovery of atomic energy, and the start of space flights, we would have to mention the complete transformation of world civilization into a consumer society. This process has guaranteed the members of this society a previously unprecedented level of well-being, but it has also created a problem mankind, despite all of its efforts, has been unable to solve. People have a new enemy, capable of pushing all others into the background by virtue of its potential danger, and the name of this enemy is garbage. Yes, I am referring to the most ordinary garbage, which

was just recently a matter of concern only to housewives and a few environmentalists. Of course, it must be said that the garbage we usually see represents only part of the great empire of waste and is probably the most harmless part.

Garbage Planet

According to omniscient statistics, people today have learned to synthesize around 10 million different substances, and just slightly over one-fifth of these are found in nature. Around 13,000 substances are produced in quantities exceeding 500 tonnes a year.

All of the man-made items eventually turn into waste. Most of the waste is accumulated during the production process. The problem of handling hazardous waste, which represents from 40 to 0.3 percent of the total according to the criteria used in different countries, is growing increasingly acute. The wide range of estimates is due to the absence of a single definition of hazardous waste in international practice. Each state sets its own standards. What is to be done with the millions and billions of tonnes of waste in the world? Some can be recycled, but this is quite expensive, and the resulting products also become waste after a while.

The economies of the developed countries, where the overwhelming majority of the world's waste is produced, are incapable of coping with the increasingly heavy burden of processing this waste. The cost of waste elimination in the United States quintupled in the last 12 years. In Germany the elimination of a single tonne of relatively "cheap" household waste costs 300 marks, the incineration of a tonne of solvents costs 2,000 marks, and the elimination of a tonne of pesticides can cost 11,000 marks. This recently created a brisk international trade in garbage and turned waste into an ordinary commodity for purchase and sale. In contrast to the trade in "classic" commodities, however, the seller pays instead of the buyer, and both parties prefer to keep quiet about the transaction. Russia, which was separated from the West by the "iron curtain" until the middle of the 1980s, has been increasingly active in this trade since the curtain disappeared—and, as the last few years have shown, not as an exporter.

Are Unrealized Plans Harmless?

At the end of last year the international Greenpeace organization published a report referring to 96 attempts to bring hazardous waste into the territory of Russia between 1987 and 1993. More than half of the reported incidents had occurred in the last year and a half. According to the Greenpeace experts, this can mean only one thing—Russia's increasing involvement in the international trade in waste.

The report says that attempts were made to bring more than 34 million tonnes of waste into our country by various means in those six years. Although most of these attempts failed—only 4,000 tonnes of old dyes and

pesticides and waste mercury, chemicals, and copper slag and around 7,400 tonnes of used vehicle tires ended up in Russia—this is hardly reassuring.

Everyone has been sending toxic refuse to Russia. Firms from the United States, Canada, Spain, Austria, Sweden, Switzerland, Portugal, and France have been prominent in this trade, but representatives of Germany are probably in the lead. More than 80 percent of the imported waste in Russia comes from that country. The FRG is bestowing its trash on Russia and other East European countries. In 1990-1991 alone, Poland received 8,000 tonnes of German waste, Estonia received 5,000 tonnes, and Romania received 3,500 tonnes. Russia, however, seems to have the greatest appeal to the Western dealers. Its vast expanses and the multitude of its own hazardous production units help to conceal these operations, while the headlong commercialization of everything in Russia and the absence of precise legislation make this an extremely lucrative and almost unregulated business.

Poisoned List

There is a fairly long list of known attempts to export the waste of Western production units to Russia. In March 1992, for example, a representative of the American firm "Tradeway, Inc." approached the administration of Kolpinskiy Rayon in Leningrad Oblast with the offer of a contract for the disposal of chemical waste from France, Germany, and Italy on the grounds of the local Krasnyy Bor disposal site. It would have been the waste of pharmaceutical production and the chemical industry, sludge from waste treatment plants, soil containing mercury, and expired medicines. Although the project was never carried out, the attempts to direct a flow of foreign waste into Russia became increasingly persistent. In October 1992 the president of "Ekorad," a Russian ecological company, delivered a letter to Boris Yeltsin from "U.S. Ecology," an American firm, proposing the conclusion of a contract with several foreign organizations on the disposal of radioactive waste on islands in the Arctic and Pacific oceans.

In January 1993 the "Petrovka" joint-stock company in Moscow delivered a bid from "TET AG," a German-Austrian firm, to the Department of Maritime Transport for the construction of a plant on the shore of the Gulf of Finland for the processing and treatment of earth from Germany. The firm promised to pay 40 German marks for each processed cubic meter of soil. That same year the Austrian "Glassimpex" company proposed not the processing, but simply the disposal, of more than 7 million tonnes of construction and household waste in various parts of the country, using the "Strom Ekologiya" scientific-production association in Novorossiysk as a middleman.

Although none of these projects was carried out, it would be extremely naive to assume that Western waste is not being brought into Russia, and there is good reason to suspect this. When foreign firms specializing in the

consignment of waste and their companions in Russia encountered the reluctance of the Russian Government and public to accept the foreign waste, they quickly changed their tactics and found a fairly simply way of circumventing existing restrictions. In transactions involving imports of hazardous waste, the waste is described as secondary resources imported for processing. Joint projects of this kind in outlying regions usually escape close scrutiny and enjoy local government support. Furthermore, this is a way of avoiding customs obstacles. As Deputy Chief Anatoliy Galaktionov of the Russian Customs Committee recently admitted, our customs service does not have any specialists today who are capable of distinguishing between waste and the secondary resources not requiring a special permit.

As a result, the waste of Western production units is making its way across the Russian border. It would be quite difficult to judge the scales of this process. Nevertheless, some cases of spurious secondary resources imported from abroad have already been reported.

In February 1993 agencies of the State Committee for Sanitary-Epidemiological Oversight discovered that cellulose waste from Germany was being incinerated in the settlement of Avsyunino in Moscow Oblast. Around 140 tonnes of materials, judged by experts to contain a whole group of harmful substances, including lead, nickel, manganese, potassium, mercury, and arsenic, had been delivered to the "Plastik" scientific-production association by the terms of a contract with the German "Linden Maschinen" firm in the guise of textile industry waste, supposedly for processing into consumer goods. Ironically, the shipping documents listed the freight as "humanitarian aid."

There was another scandal in February 1994, when waste from France and Holland was delivered to the Yuzhural-nikel Combine in Orenburg Oblast with the permission of the Ministry of Economics and the help of the Israeli "Lev Gubenko" firm. Incidents of this kind have also been reported in Stavropol and Krasnodar krais.

Garbage as a Threat to Security

The fear that Russia is turning into a disposal site for Western waste has been expressed by the international and Russian public and by government agencies. The problem of the disposal of Western waste in Russia was discussed on the governmental level for the first time this summer. The Interdepartmental Commission on Ecological Security of the RF Security Council devoted one of its meetings to this issue.

Extreme concern about the growing flow of dirty exports to Russia was expressed by Valeriy Timofeyev, deputy director of the Federal Counterintelligence Service—an organization which, in contrast to Greenpeace, can hardly be suspected of ecological populism. According to the data of counterintelligence experts, around 2,000 tonnes of hazardous waste was brought into the country in the guise of raw materials just in 1993. Criminal

groups are becoming involved in the business of polluting Russia. As a result, as Valeriy Timofeyev pointed out, the imports of hazardous and toxic waste have become a factor "posing a threat to the security of the Russian Federation."

The FSK deputy chairman said that "what Russia has encountered is a deliberate policy on the part of several Western states and transnational companies, which verbally advocate the reduction of waste export-import operations but are actually encouraging them and investing funds in the construction of waste treatment facilities in the underdeveloped countries. According to the Kissinger doctrine, Russia has been categorized as an underdeveloped nation, and it is the goal of the West to transfer dirty production units to the territory of those states. It is not surprising that the CIA will be monitoring the movement of waste throughout the world: The United States, where five percent of the earth's population lives, uses 40 percent of the world's resources and produces 60 percent of the world's waste each year."

People in Glass Houses Throwing Stones?

Whereas 102 countries in the world have already prohibited or restricted imports of hazardous waste, there are no legal barriers in Russia. The governments of Poland, Romania, and Lithuania recently banned dirty imports. Obviously, now that these countries have closed their territory to hazardous waste, the firms specializing in the placement of this waste have been even more persistent in seeking ways of penetrating Russia. Although the members of Interpol, including the Russian Federation, unanimously voted in favor of national legal instruments to regulate the movement of toxic waste, we still do not have any such laws.

The Basel convention on the control of trans-border shipments of hazardous waste and its disposal has not been ratified yet, although the decision was made more than a year and a half ago. In the sphere of waste control legislation, Russia is even lagging behind Ukraine, where a legal instrument now regulates the circulation of toxic and ordinary waste.

Russian experts, however, still cannot agree on the kind of legal instruments we need: either one law to regulate the circulation of all items included in the broad category of waste, or a group of highly specialized laws to regulate the handling of each different type of waste.

The problem of hazardous waste was created primarily by economic factors, and these still would be quite difficult to eliminate. According to one of the experts who spoke at the meeting of the ecological commission, "the West is turning into a raw material annex of Russia, with whole branches of industry working on imported raw materials for the subsequent export of finished products."

Under these conditions, it is exceptionally difficult to distinguish between imports of raw materials for ecologically dirty production units and imports of waste to be processed.

Judging by some less scandalous but nevertheless quite indicative statistics, the issue of Western waste in Russia might be much less crucial than it seems. Each year Russia produces 7 million tonnes of its own waste—i.e., 3.5 million times as much as the quantity imported from abroad. If we add the facts that no more than one-fourth of this waste undergoes any kind of processing or treatment, and that around 1.6 billion tonnes of "environmentally hazardous" waste has accumulated, according to expert estimates, in various "organized storage facilities" and simply in trash heaps over many years, the West's role in the pollution of Russia seems negligible. Russia could easily turn into one big garbage dump in the near future with no help from anyone else.

Europarlament Delegation Arrives in Chelyabinsk

LD1110221294 Moscow ITAR-TASS in English
2043 GMT 11 Oct 94

[By ITAR-TASS correspondent Yevgeniy Tkachenko]

[FBIS Transcribed Text] Chelyabinsk October 12 TASS—A team of Europarlament deputies, radioecological and economic experts arrived in Chelyabinsk today to study the radiological situation in the southern Urals.

The three-day stay is expected to include a visit to the Urals regional center of radiation medicine, the Mayak chemical plant, the area of the east-Urals radioactive trace caused by the 1957 Mayak accident, water pools of radioactive waste and the contaminated Techa River.

The delegation will focus on rehabilitation of contaminated territories, medical aid to irradiation victims, processing of radioactive waste and social protection of local residents.

Cooperation on Nuclear Accidents Agreed With Europarlament

LD1110183594 Moscow ITAR-TASS in English
1612 GMT 11 Oct 94

[By ITAR-TASS correspondent Marina Barinova]

[FBIS Transcribed Text] Moscow October 11 TASS—Russian Minister for Emergency Management Sergey Shoygu and Europarlament's representatives agreed in today's talks that the Russian Ministry for Emergency Management would continue scientific and technological cooperation with the Europarlament in controlling the impacts of radiation accidents and disasters.

The talks centered on the radiation accidents at the Chernobyl nuclear power plant and at the "Mayak" Production Association in the Chelyabinsk region.

Five short-term strategic lines of action will be diminution of effects of the Chernobyl accident, rapid delivery of humanitarian aid to disaster-hit regions (drugs, dressing materials), demining activities in conflict

regions, elevation and deconservation of dangerous sunk objects, such as submarines.

Moves have been outlined to implement programmes for the evaluation of environmental effects of radiation.

Moscow Drops Opposition to Antarctic Whaling Sanctuary

LD1110163294 Moscow Ostankino Television First Channel Network in Russian 1252 GMT 11 Oct 94

[From the "Novosti" newscast]

[FBIS Translated Text] Today we received a long-awaited document signed by Prime Minister Chernomyrdin. In this document, Russia gives its backing to the idea of establishing a whale sanctuary in the waters of the southern hemisphere surrounding Antarctica.

Unidentified correspondent: Russia supports the establishment of a whale sanctuary in Antarctica and withdraws its previous statement. At the end of last week, Prime Minister Chernomyrdin signed all the relevant documents. So, Russia becomes one of the 23 countries that have decided to create a whale sanctuary south of latitude 40. The only country to oppose the idea is Japan. Members of the International Whaling Commission feel that Russia has strengthened its position by issuing its statement in support of the sanctuary. The sensational disclosures made by the Russian representative in May 1994 about past Soviet violations of international whaling quotas have greatly raised Russia's credibility among foreign partners. The International Fund for Animal Welfare and Greenpeace International regard this as very good news for whales, which are now guaranteed a quiet life.

Nuclear Waste-Clearing System Under Threat

MM1710085194 Moscow IZVESTIYA in Russian
13 Oct 94 p 4

[Report by Sergey Shmelev: "Who Will Clear the City Streets of Radioactive Waste?"]

[FBIS Translated Text] No one, regrettably, is any longer amazed to discover radioactive waste in Russia's cities—on waste ground, in water courses, in basements, museums, and garages.... For the moment the organizational system enabling it to be confined and removed in a timely manner is still in operation. But this system will shortly be broken up. And then we will have a situation where there will be no one to remove radioactive waste from the city streets.

This depressing conclusion is prompted by analysis of the decision adopted by a number of respectable organizations (the Ministry of the Environment and Natural Resources, the Federal Inspectorate for Nuclear and Radiation Safety, the Ministry of Architecture, Construction, Housing, and Municipal Services, and the

State Duma Ecology Committee...) to transfer the "Radon" special combines to the Ministry of Atomic Energy.

The special combines (there are 16 of them in Russia) were indeed set up in the sixties with one utilitarian task, namely to take in radioactive waste from a particular territorial region for processing and storage. This kind of municipal waste does not include waste products from nuclear electric power stations [AES's] or the military-industrial complex. The amount of radioactive waste processed annually is negligible, and it is low-level waste. But whereas nuclear waste is stored at AES's or military bases, municipal waste is stored in population centers, where it can pose a direct threat to ordinary citizens in the event of incorrect storage or criminal negligence. You only need to recall soldiers' exposure to radiation at a vegetable depot in a city in Moscow oblast, or the death of the director of the "Kartontara" Joint-Stock Company from a radioactive source in a chair.

But the special combines, which are ranked as state enterprises, regrettably cannot be a source of profit. The establishments that produce the radioactive waste pay only for transportation services. Meanwhile the rates for transporting dangerous freight have been made the same as those for shipping furniture. So local administrations and the Ministry of Architecture, Construction, Housing, and Municipal Services—to which they were transferred following the reorganization of the Ministry of Housing and Municipal Services—have to fund the special combines. Incidentally, you can understand the specialists from the Ministry of Architecture, Construction, Housing, and Municipal Services, who regard nuclear waste rather as an elephant might regard a sombrero. It does not mean good business or dividends but is merely a headache. Moreover, any department is primarily concerned with geopolitical interests and not with the well-being of indigenous people.

The Ministry of Atomic Energy will not tackle territorial problems. What does it have to do with radioactive topsoil that has been lying in the Brateyevo dump by the banks of the Moskva river since Stalin's times? Why should it spend money on monitoring civilian facilities for radiation? Russia already has the lamentable experience of seeing the Leningrad special combine transferred to the Ministry of Atomic Energy. As soon as it was "attached" to the Leningrad AES, the city's radioactive waste became such a burden for the Leningrad Soviet that ultimately it became necessary to restore the status quo. Moreover, numerous Medium Machine-Building Ministry institutes have for 40 years now been unable to resolve their waste problem. Scientific diehards from the VNIPIET, the VNIINM, the VNIIAES [expansions unknown], and other design bureaus who began combating the radioactive jinn at the dawn of the nuclear power industry have already retired on pension, their place has been taken by others, and Russia's AES's are still not equipped with comprehensive waste processing equipment. Not because the technical solutions do not

exist. It is just that radioactive waste was and will remain for the Ministry of Atomic Energy an irritating obstacle, a thing of remote importance, funded on the residue principle.

European practice provides the last argument against altering the jurisdiction of the special combines. Thus, the French firm Andra, which buries radioactive waste, has been detached from the structure of the Commissariat for Nuclear Energy. This has been done in order to avoid a situation where the same minister both produces radioactive waste and monitors its destruction. Because in that case norms could be formulated to satisfy the manufacturer of the waste and reduce expenditure on localizing it.

Indisputably, the special combines have their own problems. But the existing system of localizing radioactive waste does function, despite all its shortcomings. And it can exist provided that the combines come under the jurisdiction of territorial administrative bodies. It is these that have a vital interest in the radiation security of their city, rayon, or kray. The government and the parliament should provide this highly important nature protection work with the requisite legislative base and stable funding.

Destroying this system for localizing municipal radioactive waste would be not just a rash bureaucratic decision but a serious environmental crime.

Ecological Security Part of National Security

MM1810084594 Moscow ROSSIYSKIYE VESTI
in Russian 15 Oct 94 p 2

[Report by Tatyana Sadkovskaya: "No Drinking, No Breathing, No Eating.... Ecological Security Part of National Security"]

[FBIS Translated Text] After sessions of the Russian Security Council's interdepartmental commission for ecological security an ordinary person who has suddenly found himself there would feel panicky: He should not drink, breathe, or eat but arm himself immediately with a geiger counter or placards to join the always vociferous "greens" in defending his right to life. The key word in explaining this feeling is "ecology."

At the commission's recent session there were no flagrant facts and figures—talk was of a global and theoretical nature.

Before describing its gist, one useful piece of information the interdepartmental commission thought up and the president supported was the idea of publishing an anthology of items on its sessions. The only pity is that it is planned to publish this authentic information, checked by Russia's best ecological forces, in an edition of only 2,000. I think that there is a far greater need for a comprehensive knowledge of what our habitat is like from the ecological viewpoint.

Now about the session, which I called a global and theoretical one without any irony. Boris Yeltsin's speech at the 49th UN General Assembly session developing the idea that today the former purely military understanding of the word "security" is now obsolete paid quite a lot of attention to the concept of "ecological security." The present session of the interdepartmental commission can be considered as evidence that the idea which is increasingly taking possession of the world community and which on this occasion has been voiced by the Russian president is not simply a polite bow in the direction of the civilized world.

As we know, the priority draft laws which Boris Yeltsin is recommending that the Federal Assembly examine include the Concept of National Security. The Russian Security Council is working on it now. The concept of ecological security proposed by the commission headed by Aleksey Yablokov, one of the country's most authoritative ecologists, will also form part of this very important document.

Defining the actual concept of "ecological security," the members of the commission also highlighted the priorities of state policy in this field: the ensuring of ecologically secure, stable development under the conditions of market relations, the conservation of man's habitat, the restoration of destroyed ecosystems in unfavored Russian regions, and our participation in the solution of interstate and global problems.

GEORGIA

Official Reports 800 Percent Increase in Ecological Crimes

AU0610185994 Tbilisi REZONANSI in Georgian
27-28 Sep p 2

[Report by Mamuka Saqvelidze: "The Environment Is Being Mercilessly Destroyed in Georgia"]

[FBIS Translated Excerpt] On 22 September, a press conference on biopolychromatic residues was held in the Ministry for the Protection of the Environment. The heads of the Procurator's Office and the Customs Department were invited to the press conference but they did not appear.

Iason Badridze, a representative of the Ministry for the Protection of the Environment, spoke about the necessity of creating protected territories. "In the 1960's, there were 64 animals in the Red Book [of endangered species], whereas today this number has risen to 150," stated Badridze, who added that adherence to international conventions on the protection of the environment was the only way to emerge from this acute ecological situation. According to him, changes to the Criminal Code have been prepared in the Ministry for the Protection of the Environment and passed on to the Cabinet of Ministers; these concerned the protection of rare and endangered animals and also the tightening of control at

customs departments on the removal from the republic of large quantities of timber, animals, and plant seeds. The Ministry of Foreign Affairs has been entrusted with preparing within two weeks materials on joining the convention on the control of world trade in animals.

Representatives of the Ministry for the Protection of the Environment informed journalists that the International Society for the Protection of Animals, alarmed by the ecological situation that has taken shape in Georgia, had sent a written appeal to the head of state.

Revaz Chagelishvili, deputy minister for the protection of the environment, stated that he regarded as timely Government Edict No. 634 on Georgia's Forests as there was a forest mafia operating in the country. "Sixty-eight metric tons of fir-tree seeds alone have been smuggled out of Georgia to Holland," stated Chagelishvili.

Levan Kutateladze, representative of the Procurator's Office, stated that, over the last two or three years, no criminal proceedings had been instituted regarding the killing and capture of rare animals, although there had been an 800-percent increase in ecological crimes.

"Unfortunately, as a result of the measures that have been taken, criminal proceedings have been brought against those caught felling trees but not against the members of the mafia themselves, who are often ensconced in the higher echelons of power. With this aim, the Forestry Committee has entrusted rayon forestry directors to prohibit local administrative board chairmen and their deputies from felling trees. There also exists the 1990 resolution on the preparation and export of seeds, which, to all intents and purposes, is not being implemented."

According to Nino Chkhobadze, deputy minister for the protection of the environment, there does not exist in Georgia a service for the protection of fish, while Zurab Gurielidze [not further identified] added that the Black Sea countries were alarmed by the mass destruction of dolphins in Georgian waters, which is changing and destroying the Black Sea's ecosystems. [passage omitted]

KAZAKHSTAN

Former Nuclear Test Site Land Reportedly Remains Polluted

LD0810162794 Almaty Kazakh Radio Network
in Kazakh 1500 GMT 8 Oct 94

[FBIS Translated Text] The most hazardous areas of the former nuclear test site in Semipalatinsk region of Kazakhstan do not have any signs warning people of the radiation danger. After the test site was closed, the land was returned to local farmers. Nevertheless, according to the head of the regional ecological resources directorate, this land should first have been cleared by the Defense Ministry, and only then should it have been passed to farmers. Prior to all these procedures, the test site should have been given for further research to the National

Atomic Center and then it should have been given the special regime zone status and kept under strict control.

Unfortunately, privately owned livestock graze on strontium-polluted pastures, and visitors are allowed to fish at polluted lakes and rivers. Defense Ministry authorities seem to be very relaxed about all these facts. The number of cases of cancer and of sick children is growing in the region.

Extent of Lake Balkhash Pollution Noted

95WN0007A Almaty KAZAKHSTANSKAYA PRAVDA in Russian 12 Oct 94 p 1

[Report by KAZAKHSTANSKAYA PRAVDA correspondent Tamara Grigoryeva, under the "Rush To Print" rubric: "Fish in Oil Sauce"]

[FBIS Translated Text] The damages that resulted from the sinking of the oil barge in the Bertis Bay of Lake Balkhash have been estimated at 409,500 tenge. But even this money is not going to compensate for the damage done to the lake by the spill of 6,000 tonnes of diesel fuel. And such facts, alas, are not that rare. According to the data of the inter-oblast fish protection administration, the over-the-limit discharge of copper into the lake just with the waste water of the AO [joint-stock society] Balkhashmed and that of the central heat and power generation station reaches 75 tonnes a year, of zinc—6.3 tonnes, nickel—13.1 tonnes, arsenic—6.1 tonnes, sulfates—more than 21,000 tonnes and petroleum production—12.2 tonnes a year. The damage to the reservoir's fish industry is estimated at 39 million tenge.

In addition, 9,000 tonnes of dust particles, containing strontium, tin, antimony, copper, lead, barium, arsenic, titanium, and manganese fall into the lake's aquatic area. Over the second quarter alone, the over-the-limit discharge from Balkhashmed association into the reservoir comprised more than 250 absolute tonnes of hazardous substances, the payments for which amounted to 145,000 tenge. The analysis of industrial waste discharges shows that the copper content exceeds the established maximum allowable level by a factor of 90 and even 192; of petroleum products—threefold; lead—fourfold; and arsenic—20-fold, while arsenic recovery, for instance, amounts to only 12 percent.

In order to comply with the letter of the law, that is, the Water Code of the Republic of Kazakhstan, and preserve the lake waters, a special ecological program was developed both in the association and in the city. However, because of the lack of funds, putting on line the industrial catch-basin waste water system's pumping station No. 2 is delayed. Waste discharge continues. Work has been suspended on other important ecological facilities—no money. Meanwhile, only 25 percent of the ecological fund's money stays in the city—the rest goes to the oblast center and the capital. But they do not have to breathe polluted air and drink contaminated water

over there. It is here, in Balkhash, where both people and nature suffer. Those at the top, however, stubbornly refuse to hear numerous appeals of Balkhash residents, who demand to return to the city the right to dispose on its own the ecological fund's money.

UKRAINE

Academician Urges Development of Power-Saving Technologies

WS1710143994 Simferopol KRYMSKA SVITLYTSYA in Ukrainian 1 Oct 94 p 2

[Article by Academician Volodymyr Harbarchuk of the Ukrainian Academy of Computer Science: "Odessa Terminal: Mathematics Against Idle Talk"]

[FBIS Translated Text] The Odessa oil terminal has become an inexhaustible source of "environmental" discussions and open anti-Ukrainian actions by "ecologists," "political experts," and Moscow's puppets in official chairs. However, the so-called "common reader" does not know that one of the Odessa colleges has only released a group of young specialists-ecologists this year, and that there never were "political experts" in the USSR. Having looked closer at the majority of these "ecologists," we see that these are the former authors of the ideas of transforming Odessa's seashore into sewage reservoirs and "changing the flow direction of Siberian rivers" and technologies that turn 95 percent of energy resources into smoke. Obviously, all of them are very keen on the "only true" teachings of Marx and Lenin. Instead of learning the profession of housekeepers, the former teachers of the CPSU's history and "scientific communism" have given themselves the titles of "political experts" and begun teaching students and the masses about Ukrainian history, management, privatization, and sociology. They are teaching what they have never learned. The main feature of these specialists is their constant readiness to accept a "take them" command from Moscow (the most characteristic in this regard is the position of the pro-communist majority in the Ukrainian Supreme Council, which has again delayed the issue of building the Odessa oil terminal for an undefined period of time).

Let us recall the "patriotic" attitude demonstrated by these specialists five years ago, when they were advocating construction of a nuclear monster in the vicinity of Odessa. This Moscow project was considered "truly reliable," until associate professor Yuriy Boyev studied it carefully and proven complete incompetence of its authors. However, a more formidable force is standing behind the issue of the Odessa oil terminal. After all, the Russian oil pipeline is the last thread, the last umbilical cord connecting Ukraine with the "elder brother-mother."

No developed country can exist without oil terminals: Certain countries (exporters of oil) have terminals to ship oil (Persian Gulf countries, Venezuela, or Russia),

other countries (importers of oil) have terminals to receive oil. In terms of technology, an oil terminal is an appliance to tightly connect two oil pipelines (with a 40- or 50-cm diameter), and, provided that all rules of utilization are observed, it is no more dangerous than a regular water pipe. Second, the fighters for Odessa's tidiness are keeping silent over the fact that a Russian oil terminal, with the capacity amounting of 100 million tonnes per year, has been operating in Novorosiysk for almost 30 years. It is currently standing idle, along with Russia's tanker fleet, since Russia's exports have dramatically decreased, and all the more so, since Tyumen oil is uncompetitive on the world market. It is not a problem to retool the Novorosiysk oil terminal so that it can receive oil. This is the main reason why Moscow's picketers stated that they are not against building a terminal for Ukraine in Novorosiysk (???). The policy of our "brother" is very farsighted: Russia will also have to import oil within a certain period of time, and it will be able to lease Ukraine with the help of the Novorosiysk chain. Third, a powerful terminal in Ukraine will make it possible to more efficiently import oil from the Persian Gulf to Europe, and this means that imports of Russian oil through Ukraine will decrease and the idea of building a new pipeline through Belarus and Poland will be thwarted. Taking into account an array of other factors, we will see that the far-reaching interests of the empire and billions of dollars in profits or losses are standing behind the primitive actions of the environmental bawlers. Moreover, for Ukraine, this is an issue of capability to exist as an independent state.

Let us analyze this issue deeper. The absurdity lies in the fact that no state official responsible for energy sources is able to precisely explain how much oil Ukraine needs. The system of orders for electricity and energy sources, according to which it would be necessary to increase demand every year to prove that energy, fuel, and materials are saved, is completely wrong.

If the volume of imports is defined according to the capacities of our oil-refining plants, we may have a problem of exporting surplus oil products. As we see it, the transformation to a market economy primarily requires passage from lies to precise information and uses of science. Having done this, it is essential to search for the most efficient technologies to save energy and improve the mechanisms for delivering energy and using energy sources. As a result, it may prove that we do not need to import oil. Think for yourselves. Ukraine extracts over 100 tonnes of coal per year (for several years, we were extracting more than 150 million tonnes), exports electricity (also to Russia), and extracts more than 5 million tonnes of oil. Officials say that our current demand for oil is 40 million tonnes per year (it is interesting that, according to them, it is not linked to the intensity of our industry—although production has decreased by 50 percent, demand for energy has not changed). Since our products require four or six times more energy than Western ones and six or eight times more energy than Japanese ones, elementary arithmetic

shows that, having changed the structure of production (using the money spent for oil imports), we can survive with our own energy resources and without any oil terminals. Based on the position of Ukraine's oil refining monsters, which turn 50 percent of oil into asphalt and poisons, the intellect of the "ecologists," "political experts," and specialists of the socialist economy is worth proving. Having established a power grid by replacing gas-fueled household appliances with electric ones and learning to save heat at municipal buildings (the amount of energy equal to that produced by one of Ukraine's nuclear power plant is leaking through broken windows in these "free" buildings), we could also survive without imports of natural gas. Although all this is elementary knowledge, which the civilized world learned a long time ago, I must recall it, since it is dangerous for our economy and country to exist in a state of freefall following the "socialist realism."

Minister Cites New Facts on Radioactivity

AU0410173694 Kiev DEMOKRATYCHNA UKRAYINA
in Ukrainian 29 Sep 94 pp 1, 2

[Interview with Hryhorii Hotovchyts, Ukraine's minister for issues of protection of the population from consequences of the accident at the Chernobyl Atomic Electric Power Plant, by unidentified DEMOKRATYCHNA UKRAYINA correspondent; place and date not given: "Decree No. 600 Has Been Suspended, But Boundaries of Radiation-Contaminated Zones Are Being Revised"—first paragraph is editorial introduction]

[FBIS Translated Text] The telephone at our editorial office was literally bursting on the first days of September. People were calling from oblasts affected by the Chernobyl disaster. They expressed alarm and anger and asked for specific information on Cabinet of Ministers Decree No. 600 of 29 August 1994. Apparently, the "seismic risk" of a social explosion that the document might trigger compelled the Supreme Council Presidium to appeal to the government with a request to suspend the decree. That was done. However, suspension means that, sooner or later, after some amendments, the document will become effective. That is why I turned to Heorhiy Hotovchyts, minister for issues of protection of the population from consequences of the Chernobyl AES [atomic electric power plant] accident, to throw light on the situation.

DEMOKRATYCHNA UKRAYINA: Heorhiy Oleksandrovyts, at the conference with chairmen of oblast councils, Ukraine's Prime Minister Vitaliy Masol said that Decree No. 600 had been the initiative of the Ministry of Health and the Ministry of Chernobyl. The fact that more than 600 populated areas, or about 1,200,000 citizens, will be deprived of social protection and benefits if the document becomes valid, does not somehow agree with the very name of your ministry....

Hotovchyts: This depends. Yes, we did prepare the bill. Not now, but in spring [of 1994] in fulfillment of the

Supreme Council decision adopted in February 1994 on the revision of boundaries of contaminated zones. However, in view of the fact that a large-scale election campaign was under way in Ukraine and the decision might in a certain way influence the results of the elections, we delayed it until fall. I think that it is worth looking into the history of the problem.

After the accident, we often acted by the trial-and-error method. The situation was unprecedented and such an approach was understandable. In accordance with the first variant of Ukraine's law on the status of territories contaminated as a result of the accident, and the law on the status and social protection of those citizens who were affected by the Chernobyl AES accident, the density of radionuclide contamination was taken as a basis in determining contaminated zones; the 90-percent index was used as a reference level. Those laws were adopted with reservations that the system was temporary, since at that time there were no detailed studies or methods for estimating doses of irradiation or accumulation.

It turned out later that the density of contamination of territories is not directly related to the effect of radiation on human organisms. The problem appeared to be much more complicated. Different soils showed different behaviors. Some of them, such as chernozems [black soil] and loams tend to "bind" the radioactive dirt. Others pass it on generously to plants. This may be exemplified by Volodymyrsky, Zarichnensky, and Sarnensky rayons in Rivne Oblast, where soil contamination ranges within 0.5-1-2 curies per square kilometer. At the same time, accumulation of radionuclides in foodstuffs grown on peat or sandy soils is such as it might be at a density of radioactive contamination of at least five curies.

In view of this, on 1 July 1992 the Supreme Council introduced appreciable changes into the aforementioned laws, and the irradiation dose was taken as a basis for placing populated areas in particular categories of zones. This was preceded by corresponding scientific substantiations; special methods of evaluation were developed and used for estimating the doses in those countries which were particularly badly affected by the Chernobyl catastrophe—Belarus, Ukraine, and Russia. Over three years, specialists from European research centers, in particular from the town of Juelich in West Germany, worked alongside our specialists in this direction. Well, the results of those measurements were somewhat unexpected. They showed that in many rayons, the dose actually received by the population was much smaller than estimated, something which may be accounted for by several reasons, including the somewhat increased "playing safe" coefficient.

It was precisely for that reason that in 1992 it was stated from the Supreme Council podium that the list of populated areas, especially those within the fourth zone, would be revised. However, as you can see, the old version of the law was adhered to for another two years.

We did foresee such an indignant reaction to the Cabinet of Ministers decree. We understand how difficult it is for the people to give up benefits which for many of them became a significant supplement to the family budget and, not infrequently, the only means of subsistence. However, the economic situation in the state compels us to help primarily those who need that help most.

Jointly with scientists, we analyzed the dynamics of disease in clean and contaminated areas. Here is what has been found: There is very little difference between them. This means that the rise in the rate of disease is not so much due to the radiological factor as to the psychological one and to the real deterioration in the standard of living of the population in our state. Although, of course, the rates are somewhat different in contaminated areas.

Over the eight and one-half years, the adult population has already absorbed more than 70 percent of the lifetime irradiation dose. It is therefore necessary primarily to take care of those people and those children who actually live in contaminated territories. The situation dictates the need to concentrate the funds as much as possible and provide concrete assistance so that it might be efficient and overtaking, rather than "spread" it out on everybody.

DEMOKRATYCHNA UKRAYINA: By its decree No. 639, the Cabinet of Ministers suspended decree No. 600, so that oblast councils could, within two months, submit their proposals concerning the list of populated areas that need to be considered affected. Thus, the amended document will sooner or later become effective?

Hotovchyts: That was a necessary step because, as I already mentioned, the draft document was prepared in spring. As things stand at present, the Chernobyl Ministry jointly with the National Commission for Radiation Protection of Ukraine's Population, with the participation of representatives of various ministries and departments and of leading specialists in this sphere, elaborated and submitted to the government a concept for radiation protection of those citizens who had been affected by the Chernobyl AES accident. In October, it must be discussed and adopted by the Supreme Council. In accordance with that document, the suspended decree No. 600 will be amended.

Let me point out right away that amendments will be considerable. However, the concept provides for maintaining and supplementing all the benefits for children. Assistance in large amounts will be given to those groups of the population that have already developed radiation-related symptoms—to those who are sick and have become disabled. Incidentally, those lists include categories of people who were affected by other factors related to radiation or technological accidents.

DEMOKRATYCHNA UKRAYINA: Heorhiy Oleksandrovysh, will it not happen that the already reduced list of the fourth zone will narrow down even further? Is

there a guarantee that a formal approach will prevail this time? Who and how will we ensure objective medical examination of people and a proper dosimetric control on the territories?

Hotovchyts: This anxiety is understandable. Of course, we cannot give 100-percent guarantees. In the final analysis, everything depends upon the people and upon those who have been entrusted with this work. However, we will adhere to the principle "measure thrice and cut once," and if there is the slightest doubt, the decision will be in favor of the population.

I realize how unpopular this "revision" will be. However, believe me, we cannot act differently given the present difficult situation. Yesterday I spent all day receiving mothers whose children became cripples as a result of radiation. They underwent oncologic operations or are being treated for leukemia. The law treats them as disabled from childhood, and not as Chernobyl victims. This is not fair. You know what those parents asked for? They understand the state's possibilities and demand protection for those who urgently need help.

I would like to use this opportunity and remind you that we have a single source for financing Chernobyl programs—the 12-percent tax. However, due to the sharp decline in production, the receipts have decreased manifold. Every day our economists almost tearfully try to divide those miserable sums of karbovantsi among the affected areas. The payment of compensations is delayed, and they are eaten up by inflation. For this year it was planned to allocate 16.36 trillion karbovantsi for the implementation of the Chernobyl program. This covered one-third of the necessary expenditure. In fact, over the eight months, we have not even received one-half of that sum. What is there to speak about? How can the Chernobyl laws work in such conditions?

DEMOKRATYCHNA UKRAYINA: However, even in this case, the money is allowed to circulate in banks, and social problems of clean territories are being resolved at the expense of radiation-contaminated ones. I mean those unfortunate facts, which were published by the press in Rivne Oblast.

Hotovchyts: It is the only oblast where such blatant abuse was allowed to happen. Incidentally, it is from rayons of Rivne Oblast that we are getting the majority of complaints and demands that funds be channeled directly to rayons. The Procurator's Office is presently conducting an investigation there, and the offenders will be punished. However, in accordance with the law, we must

allocate funds to oblasts. State administrations, which are now oblast executive committees, will redistribute them. It is not in our power to change this.

Besides, inertia also has its effect here. It is no secret that, until 1991, there were no special problems in financing. As much money as necessary was allocated. This led to profiteering on the misfortune, and sociocultural problems of clean areas were resolved at the expense of contaminated ones. Even to this day, the ministry receives requests for funds to build facilities in clean areas to which resettlement from affected rayons is allegedly planned. Far-fetched arguments are being advanced. However, we presently practice strict differentiation. We primarily allocate money for building hospitals and outpatient clinics in contaminated areas. Much has already been done to supply gas to Zhytomyr Oblast. Pipelines from the Torzhok-Dolyna gas main extend to Olevskyy, Korostenskyy, Ovrutskyy, and some other rayons. It is planned to lay gas pipelines across Rivne Oblast in the next few years.

DEMOKRATYCHNA UKRAYINA: You said that the adult population has already received its main dose of radiation. In this connection, I have a question: What new measures does the concept of resettlement from contaminated areas envisage?

Hotovchyts: Everything regarding the zone of unconditional and mandatory evacuation remains unchanged. Just one thing, we will treat the problem of resettlement from the point of view of new scientific knowledge. I will only quote the following example: Scientists have established that resettlement from Zhytomyr Oblast to southern oblasts, in particular to Kherson Oblast, is totally inexpedient. The evacuees may only be affected by additional natural radiation, which has always been much higher on that territory due to radon and other factors. It is an entirely different thing to resettle those people to clean rayons in Volyn. The possibility to improve one's health is much greater there. Of course, we did not know all of this before. The resettlement was not always for the better.

As regards populated areas in the fourth zone, resettlement from them must be voluntary, and, in that situation, people may only count upon themselves. It is a different matter that normal living conditions must be ensured in those regions. I mean strict control and the construction of waterways with well water, as well as gas pipelines, and the entire social infrastructure.

It is precisely for that purpose that zones are being revised.

FRANCE

'AGRICE' Set Up To Promote Clean Agro-Food

BR1310101094 Paris BIOFUTUR in French
Sep 94 p 6-7

[Unattributed article: "Enhancing the Value of Agriculture's Non-Food Potential"]

[FBIS Translated Text] Agrice (Agriculture for the Chemical and Energy Sectors) was set up barely three months ago. A Scientific Interest Grouping (GIS), its mission is to develop R&D in agriculture's new outlets (biofuels, special biodegradable chemical products), with a view to protecting the environment, improving energy self-sufficiency and limiting under-use of resources.

Apart from Ademe (Environmental and Energy Control Agency), which is responsible for its coordination and management, the members of Agrice are the departments of agriculture, industry, research and the environment, Inra [National Institute for Agronomic Research], the French Oil Institute (IFP), the General Association of Wheat Producers (AGPB), the General Confederation of Beet Farmers (CGB), the National Inter-Professional Organization of Oil and Protein Extractors (Onidol/Sofiprotol) and the companies Rhone-Poulenc and Total. Set up for a renewable term of five years, Agrice has a 1994 budget of 65 million French francs [Fr], made up of Fr40 million in public funding (Inra, IFP, Ademe, Department of Agriculture and Fisheries) to which have been added Fr25 million from three professional agricultural organizations and the two manufacturers belonging to this GIS. This budget will be allocated to the funding of R&D work. Three major programs, ranging from production to transformation and use, have energy in mind. They involve the production of oils and methyl esters from oleic protein substances, of ethanol and ETBE (ethyl tertio butyl ether) from carbohydrate-rich cultivated vegetables, and the manufacture of biofuels using lignocellulose-rich and herbaceous plants. In addition to these three programs there is the Vana program for non-food and non-energy uses of agricultural biomass, and the Envie (International Economic Environmental Monitor) program which focuses on the conditions for the integration into the socio-economic system of the choices made by the aforementioned programs.

Agrice, 27 rue Louis-Vicat, 75737 Paris Cedex 15, tel. (1) 47 65 20 00.

MOZAIC Project Measures Ozone Concentrations From Airliners

BR1710154594 Paris AIR AND COSMOS
INTERNATIONAL in French 16 Sep 94 p 17

[Christel Tardif report: "MOZAIC Reveals its first Observations on the Composition of the Upper Atmosphere—Ozone Absorption Peaks at Cruising Altitudes—Displacement of the Meteorological Equator—

Measurements Taken From the A340 Are Very Useful To Understand the Chemical Composition of the Atmosphere"]

[FBIS Translated Text] Just five months after the launching of the operation, MOZAIC [Measurement of Ozone Aboard In-Service Aircraft] is providing some first results on the composition of the upper layers of the atmosphere.

In April 1994, Air France got delivery of the Airbus 340 number 049. This is an aircraft not quite like the others because it is carrying a 120-kg unusual "passenger": an instrument which can take continuous and wide-scale measurements of ozone concentrations and water vapor during commercial flights. Thus "operation MOZAIC" has begun.

Now in September, Airbus Industries is publishing the first results of this program of unusual measurements in which three (and soon five) airlines are participating: Air France, Lufthansa and Austrian Airlines.

The MOZAIC instrument is situated in the compartment above the cockpit. It includes a central calculator which controls the ozone analyzers and water vapor analyzers which are installed on the fuselage on the front left of the aircraft (an ultraviolet detector to measure the ozone concentration and a capacitive positional sensor to measure the moisture rates), as well as auxiliary devices, a system for acquiring aircraft parameter ratios and a data processing system. The system works entirely automatically and the disk on the central unit can register the equivalent of 1,000 flight hours. Sampled every four seconds, the data are processed in the national aerospace laboratory in Toulouse (CNRS [National Center for Scientific Research] unit) and in the German research institute KFA Juelich. Once analyzed, the data are sent to the Meteo France center (French Weather Center) in Toulouse to make up a data base.

These first months of measurements have highlighted a certain number of phenomena and have validated some theories. Thus, for the vertical distribution of ozone, the measurements taken when the aircraft was going up and down have confirmed that the atmosphere has three layers or strata. The lower level of atmosphere (0 to 1.5 km altitude) is ozone depleted. The free troposphere (up to 16 km altitude for equatorial latitudes, 8 km for polar latitudes) is reasonably rich in ozone: the volume concentration is between 0.030 and 0.080 ppm [parts per million]. Finally the stratosphere (over the troposphere) is very rich in ozone with concentrations exceeding 0.100 ppm.

Stratospheric Air in the Troposphere

A more careful study of the troposphere has highlighted very homogeneous concentrations in altitude but major differences between the two hemispheres. As it crosses the equator, from North to South, the ozone concentration in the troposphere drops by half: going from 0.040-0.060 ppm to 0.020-0.030 ppm. This reduction is very

clear and happens, in actual fact, round the 6 degrees north. This confirms the tendency of the meteorological equator to move toward the northern hemisphere.

Another discovery made from these measurements in the troposphere is the presence of ozone absorbance peaks at cruising altitudes of subsonic aircraft, between 9 and 12 km. In certain places this concentration increases suddenly from 0.050-0.100 ppm to several hundreds of thousandths ppm. After comparing these with the moisture distribution rates and temperatures, it has been noted that these absorbance peaks corresponded to very low moisture rates and higher temperatures.

Moreover, it has been proven that the troposphere is characterized by a negative temperature gradient (temperature decreases as altitude increases) and the stratosphere by a slightly positive temperature gradient. Similarly, the moisture rate is higher in the troposphere than in the stratosphere. All the above factors make it possible to claim that the absorption peaks observed at cruising altitudes correspond to stratospheric air masses which penetrate the troposphere.

MOZAIC is a European joint action between the CNRS aerospace laboratory and Airbus Industries, in which a number of different organizations participate: KFA Juelich and MPI [Max Planck Institute] Mainz in Germany, Meteo France, the University of Cambridge in England, and the Tenerife University in Portugal. Estimated at ECU3 million (20 million French francs) the operation is funded for 50 percent by the Commission of the European Union. It is providing some much-needed experimental data to correctly validate the numerical models which try to define the impact of air traffic on the atmospheres' chemistry. "The latter only makes up for a very small part of human activity which may influence the atmospheric environment, but it is this which has the most direct impact on altitude," Jean-Francois Vivier from Aerospatiale's strategic studies department warns. It is now recognized that subsonic aircraft emissions, flying in the upper troposphere (10 to 13 km altitude) and supersonic aircraft, flying in the lower stratosphere (15 to 19 km altitude) may have an effect on atmospheric balance. As air traffic may double in the next ten to fifteen years we must know the impact in order to adopt the right regulations.

GERMANY

New Hesse Environment Minister Sworn In

AU0710133394 Frankfurt/Main FRANKFURTER
ALLGEMEINE in German 7 Oct 94 p 1

["ptn" report: "Plottnitz Sworn In as New Hesse Environment Minister"]

[FBIS Translated Excerpt] Wiesbaden, 6 October—On Thursday [6 October] Rupert von Plottnitz, chairman of the Alliance 90/Greens group in the Wiesbaden land parliament, was sworn in as new Hesse environment

minister, succeeding Greens politician Fischer. Previously, in line with the land constitution, the Landtag expressed its confidence in the government in its new composition with the narrow majority of the Red-Green coalition and against the votes of the Christian Democratic Union and the Free Democratic Party of Germany. [passage omitted]

Incineration Called Acceptable Alternative To Recycling

94WN0386A Duesseldorf VDI NACHRICHTEN
in German 29 Jul 94 p 16

[Article by "cf" under the rubric "Environment": "New Federal Recycling Law Does Not Bar Waste From Entering the Incinerator. Incineration As Good As Recycling?"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 29 Jul 94 (VDI-N)—In the beginning of July the new federal recycling law cleared the last parliamentary hurdle with the mediating committee's help after long debate. The most controversial clause in the present wording of the compromise: Waste incineration is as good as recycling if the facility fulfills certain requirements.

Germany has a new waste management law as of July 8. A new dimension is to be gotten in waste management policy with the passing through the Bundestag and Bundesrat [lower and upper houses of federal parliament] of the federal recycling law: A course away from waste disposal toward the recycling economy. Federal Environment Minister Klaus Töpfer hopes that "The federal recycling law will set the course for the more effective conservation of our raw-material resources and the development of low-waste products, and thus for changing in the long term the entire consumption and production system to a recycling economy."

The new "Law for the Promotion of the Recycling Economy and the Ensurance of Environmentally Compatible Waste Disposal" has the following salient points:

It establishes a new precaution-oriented concept of waste. Waste is no longer just things that their possessor wants to throw away. In the future waste will also be products and scrap materials that are neither being produced with a purpose nor being used according to their purpose. This includes metal chips or toxic substances from industrial production, as well as old cars and newspapers. "This stuff has been able to be treated till now as putative merchandise not accountable for ecologically, and has brought us many an export scandal," says Töpfer.

This hole is to be plugged now. As far as this waste is to be recycled, the law designates it in accordance with the EU's "Waste for Recycling" law, and non-recyclable waste is accordingly called "Waste for Disposal."

In addition, public responsibilities for the avoidance of waste are defined in central spheres of production and

consumption: On the one hand, waste must be avoided already as far as possible in industrial production processes by, for example, the integrated recycling of feedstocks, oils and solvents. On the other hand, through legal liability for products, products themselves are already to be designed so that waste is reduced when they are being manufactured and used, and that environmentally compatible recycling and disposal are ensured after they have been used. Products are to be reusable, have a long service life, be easily repaired and contain a low level of pollutants.

Still No Specific Regulations for Practice

However, liability for products can be legally enforced in the future too only by means of regulations. "Legal liability for products, however, will trigger the definite strengthening of voluntary initiatives by industry," the minister hopes. In addition, industry's stronger liability is to give impetus to the already prepared product regulations for electronic waste, old cars and waste paper.

Unavoidable waste is to be made use of in an environmentally compatible manner. Making use of in the materials respect (recycling) and in the energy respect (incineration) are equally permissible here. The federal government, according to information from the Federal Ministry for the Environment (BMU), wants to define through regulation the precedence of the kind of utilization for individual kinds of waste, e.g., recycling quotas for packaging and waste paper.

As long as no such regulation yet exists, waste can be recycled or incinerated. Incineration presupposes that the waste has a heating value of 11,000 kJ/kg, the incineration facility attains heating efficiency of 75 percent, and the heat produced is used internally or is given over to a third party.

According to BMU, these preconditions are to ensure that conventional waste incineration, especially of household refuse, is not "making use of in the energy respect" under the law. Christine Meinecke, waste expert of the German Association for the Environment and Nature Conservation (BUND) in Bonn, opposes this. "The compromise wording, that incineration be permitted only if a minimum fuel value of 11 megajoules per kilogram is attained, is nothing more than self-delusion by playing down problem." Mixed household refuse in communities that collect discarded glass products and biological waste separately already today attains a fuel value that is above this limit, and is thus generally approved for incineration, she says.

The law stipulates as a further point that only that waste should be disposed of that cannot be made use of. Yet the legislature is demanding the highest possible safety standard for the environmentally compatible treatment and dumping of the waste to be disposed of.

Not least, business and industry are to take care of their waste essentially as their own responsibility and at their

own cost. Moreover, they can engage third parties and trade associations and chambers for this. Through the privatization of waste disposal the law obligates business and industry to fulfill high-tech requirements in waste disposal too, just as these requirements are a matter of course in production.

Wind Tunnel Used To Mitigate Emissions

94WN0386B Duesseldorf VDI NACHRICHTEN
in German 29 Jul 94 p 16

[Article by "cf" under the rubric "Environment": "The Diffusion of Power Plant and Industrial Gaseous Emissions Can Be Determined in Advance in a Model. Pollutants in the Wind Tunnel"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 29 Jul 94 (VDI-N)—Can still another industrial establishment be sited in an industrial area without a near-lying residential neighborhood's suffering too much under the gaseous emissions? Can responsibility be taken for building a tunnel in addition at the edge of an in any case already heavily used inner-city zone? Wind tunnel experiments are helping to answer such questions.

Most studies on problems of air quality are components of expert opinions on potential smokestack and cooling tower emissions. TUV [the Technical Control Board] and the operators of power plants and nuclear power plants are the primary clients. "Here one is concerned with the question of the most favorable location in connection with buildings," states Professor Erich Plate, head of the Institute for Hydrology and Hydroeconomy at Karlsruhe University. If one is to determine, for example, how emissions of cooling tower fumes make themselves felt, they are made visible by means of smoke in a wind tunnel in order to be able to identify areas critical in terms of quality.

The kind of wind tunnel is important for success. The scenarios of interest are realistically modeled in a measuring chamber over 10 meters long and 2 meters wide. With the development of the thermal-layer tunnel it became possible to produce air streams with various temperature layers. By this means the scientists in Karlsruhe are investigating how thermal effects like atmospheric conditions of inversion or cold air streams affect the diffusion of pollutants.

The conventional wind tunnel by means of which the construction engineering aerodynamics department of the Institute for Hydrology and Hydroeconomy is making air quality studies is a boundary-layer tunnel. In order to be able to simulate the natural diffusion of pollutants, a blower produces an air stream that models, scaled down, the structure of the ground-level air layer with its turbulence. The air is blown through the measuring chamber, in which there is a miniature model of the groups of buildings in question. Finally, a study is

made of the flow resulting from the combination of the boundary-layer flow and group of buildings.

In the new thermal wind tunnel, thermally layered air streams are also being used in addition for the first time. Ten air flow layers, one above the other, are controlled individually and produce a differentiated temperature-and-velocity distribution. In this way ground-level atmospheric mixing zones can be modeled, such as originate under atmospheric conditions of inversion because of heating up of the ground. The cost of development of the new wind tunnel, which went into service last year, was high. Five computers control the individual blower outputs, the temperatures in the individual air layers and the heating of the ground. The air velocity and turbulence are measured by means of advanced Doppler laser technology.

The scientists are presently working on the question of how built-up areas generally affect the diffusion of exhaust gases from roads or gas accidents. The wind tunnel is a must for studies precisely when the diffusion of gases is shaped primarily by streets lined with buildings and by the kind of development. In the "far field" the development plays just a minor role and affects the diffusion process indirectly through the structure of the turbulence. "By means of such basic research it is possible to determine whether certain critical values are met in the various concentration ranges of gases," Plate explains. "In addition, it is possible to develop incident-alarm systems for potential gas accidents."

Use of Composting To Treat Waste Described

94WN0386C Duesseldorf VDI NACHRICHTEN
in German 29 Jul 94 p 16

[Article by Rainer Antkowiak under the rubric "Environment": "Waste Can Be Conditioned by Anaerobic Pretreatment. Composting Becoming Easier"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 29 Jul 94 (VDI-N)—Fermentation gas and compost are the end products of a combination process that could help to clear away the mountain of just under eight million tons of organic waste per year in Germany. The Waasa process developed by engineers at the Avecon environmental technology firm domiciled in Vaasa, Finland, makes it so that wet, poorly structured organic waste that is otherwise problematic as regards rotting can be composted in the conventional manner.

"The Waasa process is simple and dependable," is how Leif Akers, chief operating officer of publicly owned ASJ Waste Treatment Ltd. in Vaasa sums it up. It is the proprietor of a benchmark facility of this type, and with a capacity of 25,000 t/a disposes of the household biological waste of 200,000 residents. "We can also process slaughterhouse waste or sewage sludge," Akers says.

Everything starts quite unspectacularly. The biological waste is sorted and aerated in a screening drum. Reiner Schowlow, waste disposal marketing department head at Thyssen Still Otto, the licensee and marketer of the Waasa process says, "Closed paper bags and plastic bags are ripped open in the screening drum by built-in blades." Most of the shreds of white plastic of the plastic bags unfortunately can no longer be completely removed later, admits Jan Teir, head of process development at Avecon. No reliable separation process could be found, so part of the plastic lands in the compost, impairs its quality and appearance and makes it difficult to sell it.

The waste from the screening drum, with the impurities and coarse materials removed, is either recycled directly into the screening drum, disintegrated in a pulverizer, or delivered for composting. Iron-containing impurities are separated by a magnetic separator.

Then the biological waste, together with water brought to a certain temperature, goes into the so-called mix separator. "Here collected garbage is separated or also mixed waste is converted into biomass that has the right consistency for subsequent fermentation," Teir explains. The blended biological waste in the 150-m³ tank is brought to an optimal dry-matter content and is sorted according to its density. Heavy bits sink down and are collected there over several days. Lightweight material floats up and eventually is also drawn down when the tank is emptied.

Then a reciprocating pump transfers the biomass in the mix separator to the twin reactor for fermentation and fermentation gas production. Here an antechamber sees to the separation of impurities again, as well as to the start of fermentation under anaerobic conditions. For this purpose biomass is injected into the antechamber from the most biologically active zones of the reactor's main chamber. "Our bacteria injection system," says Teir, "shortens the starting phase of the fermentation and thus speeds up quite substantially the conversion to fermentation gas." Gas formation is aided further by the controlled injection of fermentation gas into the main chamber and by a design feature: A swirl zone make it so that not the entire contents of the reactor are blended, but only the area that can be fermented most effectively. It takes 15 days for the particles in the main reactor to pass through the various stages of disintegration of the organic matter to the gas phase.

The specific quantity of fermentation gas that is drawn off, cleaned and converted in a gas-fueled generator into electricity - about 330 kWh per ton of waste - and heat amounts to 100 to 150 cubic meters per ton of biological waste. "Thus more than enough home-made energy is available," Schowlow [as written] explains, "to incorporate energy-self-sufficient composting in a second process stage." The floor space required now is also smaller than for conventional composting plants. Matter that because of its high water content usually causes difficulty in ventilation of the Minton element has become compostable because of the pretreatment in the twin reactor.

It aids fermentation gas production. The dehydrated fermentation residue (about 50 to 60 percent of the input) from the twin reactor is composted along with the rest.

This was not always so. There were big problems at the beginning. To begin with, anaerobic waste treatment, i.e., composting, was put before the anaerobic fermentation gas phase. When it was realized that this was a mistake, the developer found out that the reactor charge was too dry and not enough fermentation gas passed through. "Before Avecon began its development work," Teir relates further, "several other companies had already gone bankrupt on this problem."

Salts Used To Capture Mercury for Clean-Up

94WN0386D Duesseldorf VDI NACHRICHTEN
in German 5 Aug 94 p 16

[Article by Rainer Antkowiak under the rubric "Environment": "Cleaning of Flue Gases by Means of Zeolite. Salts Trap Mercury"]

[FBIS Translated Text] Duesseldorf, 5 Aug 94 (VDI-N)—Metallic mercury, dioxins and furans from incinerator flue gases can be trapped on a new kind of zeolite. Mercury is recovered and the organic pollutants are destroyed. The advantage of the Medisorbon technique of Lurgi Energie und Umwelt GmbH [Energy and Environment, Ltd.] in Frankfurt: "We are offering for the first time as a new development on the market a closed physical cycle for metallic mercury," stresses Ole Petzoldt, adsorption technology sales manager at Lurgi.

The heart of the technique developed together with Degussa in Frankfurt is a filter system based on Degussa's Wessalith Day adsorbent, a zeolite. Zeolites are inorganic silicates in which as a rule a third of the silicon atoms have been substituted by aluminum. The crystal structure of aluminosilicates exhibits open channels in which molecules are held in a matching quantity. Accordingly, zeolites are good adsorbents. In Degussa's Wessalith Day zeolite it has been possible to make the percentage of aluminum atoms low. Klaus Schneider, head of the field of concentration of pigments at Degussa says, "The extremely low aluminum content is the reason that our modified zeolite differs from conventional zeolites." It is not strongly hydrophilic like the others, but extremely water repellent and especially suited for the selective adsorption of nonpolar compounds from moist gases, he says. It consists largely of silicon dioxide and is consequently not flammable, and it functions, temperature resistant, to 1000 degrees Celsius.

Mercury is adsorbed via a chemical reaction. "The additional sulfur impregnating agent enters into a stable insoluble compound with the adsorbed metallic mercury," Schneider explains. Mercuric sulfide forms. The technique has proved its worth in the cleaning of mercury-containing gases from the incineration of sewage sludge at a facility in Dordrecht in the Netherlands.

Plant Converts Waste Into Raw Materials

94WN0386E Duesseldorf VDI NACHRICHTEN
in German 5 Aug 94 p 16

[Article by Christa Friedl under the rubric "Environment": "New Combination Process Is To Recover Recyclable Materials From Waste for the First Time in Lower Saxony. Conversion at the Waste Front"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 5 Aug 94 (VDI-N)—Lower Saxony is writing waste history: In the rural district of Northeim the first facility is coming into being that will convert according to the so-called household waste conversion process dump waste and sewage sludge into energy and recyclable materials.

The rural district of Northeim will over the short or long term no longer need a dump. Markus Hubig, chief executive of EAM Umwelt GmbH [Environment, Ltd.] in Kassel, made this sensational forecast public in the middle of July. The trash of the rural district of Northeim not far from Göttingen is presumably to be removed from this world by a new disposal process as of 1997. Then the dump will be superfluous for two different reasons: For one thing, with the process there will be almost nothing left to dump. For another, the leftover waste of today's dumping grounds is also to be disposed of.

This will all be possible by a combination process - the conversion process - developed by Noell Abfall und Energietechnik [Waste and Energy Technology] in Würzburg and run by EAM. This process takes place in two stages. At the first stage the waste is exposed to a temperature of 550° Celsius for around an hour in a rotary dryer with the exclusion of air. The organic constituents are thereby carbonized to coke and a multitude of liquid and gaseous hydrocarbons. The energy of these pyrolysis products is utilized at the second stage - entrained-bed gasification: Hydrocarbons and finely ground coke are cracked in a reactor at 25 bars and around 2000° Celsius with technically pure oxygen into a synthesis gas having as its main components carbon monoxide and hydrogen. The ash that forms fuses at the high temperatures and is removed as slag that solidifies to a vitreous granulated material upon prompt cooling.

What remains is recyclable metals that are separated from the pyrolysis coke, and slag incorporating heavy metals. The crude gas is cleaned by a multistage process, whereby sulfurous waste matter is produced. Waste matter also originates when the waste water is cleaned. "Nearly all the materials can be recycled," Hubig declares. "Only the salts from cleaning of the waste water have to be disposed of as waste for special treatment" - around three grams per kilogram of waste.

According to Hubig the plant generates around 6 MW of power. A small part of this heats the low-temperature carbonizing dryer for pyrolysis, and the largest part is used in order to generate electricity and steam. The

electricity is used in large part for the air-separation plant, which produces the oxygen for the high-temperature gasification.

The Thermoselect process, the Siemens KWU low-temperature carbonization process, and a process of Veba I [Oil] are also based on the combination process in which the low-temperature carbonization of waste is combined with high-temperature gasification or incineration. EAM subjected to a comparison the offerings of Noell, Veba I and Thermoselect. According to Hubig there were several reasons for the conversion process. Noell guarantees for the planned 100,000-tons-per-year plant flue gas whose emissions are "distinctly below the legal limits" for heavy metals, dioxins and furans, for example. The new formation of dioxins and furans is to be prevented because of the oxygen-free atmosphere and the rapid cooling of the gases.

The process works especially well, Hubig says, because small plants can also be operated economically. With an investment of 250 million German marks [DM], the conversion plant is more advantageous than a conventional waste incinerator. But waste disposal becomes inexpensive primarily because the cost of disposing of and melting the slag is omitted, and, besides, the more distant transportation of waste will become unnecessary through the construction of decentralized plants. All in all, the disposal of a ton of waste will cost around DM420.

The interfacing of pyrolysis and gasification is new, because on a large scale both stages have thus far been run separately. Hubig says, "The upscaling of both components could cause problems." Thus far there has been little experience with pyrolysis dryers and high-temperature gasification on the scale planned.

The process comes at just the right time. In Germany, according to the "Household Waste Disposal Technical Guidelines," as of the year 2005 only thermally pretreated waste having a maximum of five percent of organic constituents is to be dumped. The conversion plant in Moringen-Blankenhagen will also dispose of leftover waste from the dump, in addition to household waste and sewage sludge. Besides, the dump is acting both as an intermediate storage facility for waste, and for intermediate products like coke or the slag intended for recycling in road construction. The Institute for Energy and Environmental Research (IFEU) in Heidelberg is presently studying whether the process fulfills the requirements of environmental compatibility testing.

Speed Limits Called Ineffective in Reducing Ozone-Producing Emissions

94WN0386F Duesseldorf VDI NACHRICHTEN
in German 5 Aug 94 p 3

[Article by Christa Friedl under the rubric "This Week":
"Automobile Industry Association Protests Against

Traffic Restrictions in Summer Smog. Braking for Ozone?"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 5 Aug 94 (VDI-N)—Anxiety concerning ozone is unjustified in most cases. Speed limits reduce ozone pollution only negligibly. The policy measures already introduced are sufficient to reduce vehicle emissions. With these statements the automobile industry association is now making it clear where it stands in the debate concerning the ozone threat.

Traffic restrictions, speed limits, driving bans for vehicles without catalytic converters, the barring of traffic from inner cities - heated issues that every year push the car into the center of the ozone debate. With good reason: According to data from the Federal Environment Ministry in Bonn, traffic is responsible for 70 percent of nitrogen oxide (NO_x) emissions and 50 percent of volatile hydrocarbons. The irritant gas ozone forms from these so-called precursor substances with the aid of strong sunlight, and aldehydes, aerosols and aggressive photo-oxidants like peroxyacetyl nitrate form in addition. This "summer smog" irritates mucous membranes and can lead to headaches, circulatory ailments and watering eyes. Ozone, as a water-insoluble substance, reaches deep into the alveoli and reduces respiratory tidal volume.

All the same, the equation "Less Traffic Saves Us Ozone" is not that simple. The ozone cycle has numerous murky areas besides. "The mechanisms of the origin of ozone near the ground are complex," emphasized Dr. Norbert Metz, head of the energy and environment department at BMW, at a meeting of the Association of the Automobile Industry (VDA) last week in Frankfurt.

Vehicle emissions are actually only one of numerous factors exerting an influence. For instance, the wind and radiation situation, topography and deposition, atmospheric turbulence and humidity also play a role. Also, there is broad agreement today that part of the ozone near the ground is transported there from higher layers, even from the lower stratosphere at an altitude of 15 km. Prof. Reinhard Zellner, head of the Institute for Physics and Theoretical Chemistry at Essen University, estimated at VDA's meeting that "the amount carried in like this equals around 20 percent of the total amount of ozone that forms." All these facts made VDA Director Prof. Gunter Zimmermann sum it up as follows: "The present state of our knowledge does not justify regulatory measures against the automobile."

On the other hand, Hesse pulled the emergency brake on July 26. The two main conditions for Hesse's speed-limit regulation pertaining to ozone were fulfilled for the first time on this day: Ozone levels of higher than 215 µg/m³ were measured at at least three measuring stations 50 km apart from one another. Second, a stable weak-exchange weather situation stood in the way of removal and dilution of the irritant gas. Under the slogan "Speed

Limits Against Summer Smog" the Hessian environment ministry, through a maximum speed of 90 km/h on superhighways and 80 km/h on all other roads, wants to prevent "further increasing of the maximum ozone level of 300 $\mu\text{g}/\text{m}^3$ to 400 $\mu\text{g}/\text{m}^3$."

No one even at the ministry in Wiesbaden can say whether this will be possible because of the speed limits. Ozone defies simple cause-and-effect relationships. First, it is not emitted directly as other pollutants are, but forms in the atmosphere and also breaks down again through chemical transformation processes. And yet, how much ozone forms and how quickly it forms depend not just on the amount of precursor substances. Second, emission sources and ozone formation are not connected in space and time. "Ozone can form 30 to 50 km away from the pollution source," says Prof. Peter Fabian, holder of the professorship in bioclimatology and pollution research at Munich University. This is also the explanation for especially high ozone levels in so-called clear-air zones outside congested areas.

Because a given measure can only with difficulty be correlated directly with rising or falling ozone levels, this irritant gas leads to heated debates not only among politicians but also among scientists, physicians and toxicologists. "Fearmongering is often engaged in," Prof. Erich Elstner of Munich University opined at VDA's meeting. And "failures of occurrence do not represent damage," the phytopathologist says. The obstruction of the respiratory tubes when high ozone levels are present has "nothing to do with a sign of toxicity," Elstner says.

However, not everyone agrees with these "all-clear" signals. Prof. Michael Wagner, ozone expert at the Federal Public Health Office in Berlin, continues to plead for reasons of precaution that children and ozone-sensitive adults forego unusual physical exertion with levels from 160 $\mu\text{g}/\text{m}^3$ - even though everything thus far indicates that ozone in the concentrations occurring in Germany does not result in permanent harm to one's health. According to Elstner, one knows of permanent tissue damage in residents of Mexico City, for example, where the ozone level is almost constantly between 350 and 800 $\mu\text{g}/\text{m}^3$. On the other hand, the fact that ozone in concentrations as low as 70 $\mu\text{g}/\text{m}^3$ impairs the growth and metabolism of certain cultivated plants is undisputed. According to information from the Federal Environmental Agency (UBA) in Berlin, studies from the USA and the Netherlands come to the conclusion that crop losses because of ozone pollution are at the level of billions per year.

VDA also expects that the pollution load from traffic, in spite of everything, will have to be reduced further. "Nevertheless," VDA Director Zimmermeyer says, "the policy measures introduced thus far are sufficient." The exhaust gas load from traffic has been in the process of being reduced since as early as 1989, he says. Catalytic converters and activated carbon filters in passenger cars, suction hoses at gas stations, the reduction of benzene in gasoline and the European standard for commercial

vehicles, according to VDA's forecasts, will result in a reduction in emissions in the old federal states by the year 2000, versus 1991, of by 78 percent as regards hydrocarbons, and of by around 65 percent as regards nitrogen oxides. The legislature should leave further measures to the automobile industry, says the VDA. For instance, according to BMW environmental expert Metz, shortening of the inefficient cold-starting phase in the catalytic converter and reduction of the especially reactive hydrocarbons in gasoline are being tested.

All the same, the car continues to remain the focus of the debate. The American environmental agency, the EPA, came to the conclusion as long ago as 1989 that in California damage to health because of automobile exhaust gases occurs to the tune of at least \$10 billion per year. Calculations are presently being made at the UBA too: "We want to know the environmental costs brought about by the automobile in Germany," UBA spokesman Dr. Holger Brackemann explains. At present he cannot yet make a statement concerning the level. According to his estimates it could be definitely "at the three-figure billion level."

Illegal Dumping Said To Be Increasing

94WN0386G Duesseldorf VDI NACHRICHTEN
in German 5 Aug 94 p 4

[Article by "cf" under the rubric "This Week": "Federal Environmental Agency Publishes 1993 Annual Report. Waste Being Disposed of Illegally More and More Often"; first paragraph is an introduction]

[FBIS Translated Text] Duesseldorf, 5 Aug 94 (VDI-N)—Emissions of the greenhouse gas carbon dioxide are declining in Germany. Three quarters of all dumps in Germany will be filled by the year 2000. As before, agriculture is one of the biggest water polluters. Environmental crime is rising, while the proportion of crimes solved is falling. This is the main message of the 1992 annual report of the Federal Environmental Agency (UBA) in Berlin, which UBA President Dr. Heinrich von Lersner and Federal Environment Minister Klaus Töpfer made public last week in Bonn.

The unification of the two Germanies has also brought a change for the greenhouse gas carbon dioxide: German CO_2 emissions have been declining since then. The per capita emissions of the western and eastern federal states are by this time likewise high at 11.1 tons and 11.3 tons, respectively, "but by the mid-80s the GDR was the world champion in CO_2 ," Töpfer stressed. However, the UBA report says, Germany's efficiency in the use of energy has not improved in the years that have passed. As before, nearly two thirds of the energy used are lost mostly in the form of waste heat.

Things are getting cramped at German dumps. "The space of approximately 916 million cubic meters available in 1990 will be more than three quarters full by the turn of the century," the report states, "if no new dumps are created or old dumps expanded." But in spite of

legislation granting relief for investment, new dumps will hardly be able to be approved in the face of public resistance.

UBA is following with concern the increasing taking of waste underground into mines. Around 1.13 million tons of non-mining waste material were put into mines in Germany in 1992, it says. This "recycling for mine filling" is just hard to differentiate from waste dumping, because elsewhere the same refuse is disposed of in underground dumps licensed under the waste disposal law, in which a higher environmental standard is ensured.

The report again devotes a full section to agriculture. It is still responsible for high pollution. For instance, approximately 55 percent of all nitrogen entry and 40 percent of all phosphorus entry into waters presently originates from agriculture. The pesticide limit of 0.1 µg/l is being exceeded today in 3.2 percent of all studies of ground-water and surface water reported to UBA. Eighty-five percent of all ammonia emissions into the air come from keeping animals. Ammonia is made a sharer of the responsibility for forest damage.

Environmental crimes are on the rise. In 1993, 29,732 cases of crimes against the environment were recorded, i.e., four percent more than in 1992. Of these, 62.5 percent fell under the class of waste disposal threatening the environment. These offences increased by just under seven percent versus 1992. An additional 29.3 percent represent water pollution. On the other hand, the number of crimes solved has been dropping for years. In 1988, 76 percent of environmental offences were still able to be solved, while the figure was 64.2 percent in 1993.

Lersner took advantage of the opportunity to draw attention to UBA's extremely thin provision with funds for research contracts as well as for the subsidizing of investment by German industry in environmentally friendly technologies. In particular, the money for investment was cut by more than 40 percent in the current year, and a further cut by 24 percent is planned for 1995. This means that only a few new projects will be able to be supported in the coming year. In the past these demonstration projects were quite often the basis for environmental regulations, such as the "Technical Guidelines for Clean Air" and the regulations for large furnaces.

There have been drastic changes at the agency itself. In order to make allowance for the further development of environmental policy thinking, as of September UBA will change its organizational structure oriented around the classic environmental media of water, soil and air, and be divided into five new divisions: environmental planning and strategies; environmental quality and standards; environmentally compatible technology, processes and products; and substance rating and enforcement.

The annual report can be obtained at no charge from: Umweltbundesamt, ZAD, Postfach 330022, 14191 Berlin.

Concentrations of Hydroxyl Radicals Measured

BR1310104894 Bonn *TECHNOLOGIE-NACHRICHTEN*
MANAGEMENT-INFORMATIONEN in German
30 Aug 94 pp 18-19

[FBIS Translated Text] The international air chemistry field measurement campaign POPCORN [Photo-Oxidant formation by Plant emitted Compounds and OH Radicals in North-Eastern Germany] was carried out from 2 to 25 August in Mankmoos near Warin (Mecklenburg-Western Pomerania). Under the leadership of the Juelich Research Center GmbH [KFA], about 30 scientists from the University of Lancaster, the Technical College of Vienna, the University of Ljubljana (Slovenia), and the universities of Heidelberg, Rostock, and Wuppertal operated more than 25 measuring devices, round the clock in some cases. The measuring procedures used range from modern laser spectroscopy through highly developed instrumental analysis to the fully automatic and continuous, computer-controlled collection of meteorological data. The project is being financed by the Federal Ministry of Research and Technology and the European Union.

Ozone is formed photochemically in the lower atmosphere from organic trace gases and nitrogen oxides. The concentration of nitrogen oxides in the atmosphere in central Europe is determined primarily by combustion processes (motor vehicles/industrial emissions). Sources of organic trace gases are both human activities (industrial emissions, car exhausts, use of solvents etc.), and vegetation. The concentration of organic trace gases in rural areas in the Federal Republic of Germany is typically around one millionth of a gramme per cubic meter of air. These gases are made up of a large number of different compounds of varying significance for ozone formation, depending on their concentration and (photochemical) reactivity.

World emissions of organic trace substances amount to 1,000 to 1,500 millions tonnes, about 80 percent of which come from biological sources, particularly plants. For a densely populated and industrialized country like the Federal Republic of Germany, the proportion of emissions caused directly by man is markedly higher, but the contribution made by biogenic emissions is by no means negligible.

Numerous substances, including organic trace substances, are broken down and converted in the atmosphere by reactions with hydroxyl radicals. The speed with which the organic trace substances are converted and broken down in the atmosphere is determined by the concentration of hydroxyl radicals (OH radicals). The concentration of OH radicals in the atmosphere is extremely small. There is one hydroxyl radical in 10,000 billion air molecules. Nevertheless, this radical controls the ozone concentration in the lower atmosphere through the reaction with the organic trace substances.

In view of the extremely low concentration, OH radicals are extremely difficult to determine. Two processes were developed at the Institute for Atmospheric Chemistry of

the Juelich Research Center which enable such small concentrations to be determined. Both methods are being used in POPCORN.

The following questions are being explored within the context of the POPCORN measuring campaign:

- How large are the emissions of organic trace substances from biogenic sources?
- What proportion of the organic trace substances measured in the atmosphere is of biogenic origin, and what proportion is anthropogenic (caused by man)?
- How high are the conversion levels of organic trace substances, and what factors determine the rates of conversion?
- What factors determine the efficiency of ozone formation during the breakdown of organic trace substances in the atmosphere?

The results of the POPCORN measuring campaign will expand our knowledge about the complex processes in the atmosphere, and will also help to improve and optimize strategies and measures for reducing ozone in the lower atmosphere.

Further information can be obtained from Prof. Dr. D.H. Ehhalt, Institute for Atmospheric Chemistry (ICG3), KFA Forschungszentrum Juelich GmbH, Postfach 1913, 52425 Juelich, tel.: 02461/613741, fax: 02461/615346.

Pilot Plant Decontaminates Uranium, Radium From Polluted Waters

94WS0528A Munich DER FRAUNHOFER V 2, 1994 pp 32-33

[Article by Monika Weiner: "Special Molecules Decontaminate Polluted Water"]

[FBIS Translated Text] *They filter out poisons, drain sludge, capture heavy metals, cleanse raw materials, protect against rust and even make hair manageable. Water-soluble polymers can be used almost anywhere. Researchers at the Fraunhofer Institute for Applied Polymer Research (IAP) are working on the design of new molecular structures. They are developing new polymers which can do even more: they help clean up waste sites, treat drinking water, clean waste water in water purification plants and refine products.*

The backdrop is the Erz Mountains. Once people dug for silver here. After the Second World War uranium mining began on a large scale. Along with the ore, mountains of "dead" stone saw the light of day and ended up on the slagheaps. After reunification mining was halted. But the results remained: rainwater becomes contaminated with uranium, radium and arsenic through contact with the radioactive stone, flows out from under the slagheaps and reaches streams, lakes and the ground-water. An environmental problem that grows with every rainstorm.

High time to do something. "Traditional purification procedures reach their limits here," explains Dr. Werner Jaeger of the Fraunhofer Institute for Applied Polymer Research (IAP) in Teltow. The reason: the heavy metal salts are toxic, cannot be filtered out, and are resistant to absorption by microorganisms and other biological decomposition processes. Classical separation procedures, such as hydroxide or sulfide precipitation, are too complicated or too inefficient.

The new defense against radioactively contaminated water seepage developed in the "water-soluble polymers" working group at the IAP has no side effects. It answers to the exotic name PAN-HYA, is effective, economical, odor-free and reusable. It belongs to the family of synthetic water-soluble polymers. Non-water-soluble polymers, on the other hand, are suitable for the manufacture of flower vases, gutters and plastic packaging.

This PAN-HYA is for dump site cleansers what worms are for the fisherman: bait. Polymer molecules become bait by being given a clearly defined chemical structure in which characteristic ion groups are arranged at certain locations. Such giant molecules, which have different charges at their ends and thus can react multiply, as a base or as an acid, are called polyampholytes. When uranium compounds "take" the bait, PAN-HYA changes into thick, highly sedimentable flakes which can easily be separated.

This procedure is already being used in a pilot plant in Poehla, on the grounds of the company Wismut AG. The plant was developed by Fraunhofer researchers together with the Hildebrand Ingeniurbuero GmbH. Here 50 liters of percolated water an hour are decontaminated: first the right pH value must be created by the addition of acids; then barium salts are added. The result is a barium sulfate precipitate which is precipitated together with the radium. In the second step, PAN-HYA is added, and the uranium attaches itself to it. In the process flakes are formed which can be filtered out. The uranium compounds are concentrated in the resultant filter cake. The remaining percolate is now free of uranium and radium. It does still contain arsenic, which is eliminated by the addition of iron: ferrous arsenate is precipitated and filtered off. What is left now is pure water without radioactive or toxic residues. "The pilot plant has shown that PAN-HYA is an effective means of water purification," says the project director, Dr. Ulrich Gohlke. As early as next year a large plant operating on the same principle should be opened. It will be able to clean 500 cubic meters of water an hour.

Heavy metals are not the only materials which Jaeger and his colleagues catch with polymers. Differently constructed polyampholytes allow dyes, oils and tensides to be separated out. These materials combine with positively or negatively charged "anchor groups" on the polymer molecules. Polyampholytes are therefore used for waste water purification in the dye industry, in purification plants and in the metal-processing industry.

A special receptor must often be developed in order to filter out all poisonous substances—a combination of different polymers. Even water-repelling—hydrophobic—chemicals can be precipitated with water-soluble polymers. The trick is to build hydrophobic groupings into the polymers, where the water-resistant chemicals, such as insecticides, then tie up.

Finely divided, suspended particles or suspensions can also be lured with polymers. What is needed is positively charged molecular components—so-called cationic polyelectrolytes. "The suspensions have a negatively charged surface which surrounds them like a brush; they repel each other and therefore do not form clumps," explains Jaeger, director of the "water-soluble polymers" working group. If you add cationic polyelectrolytes, the negatively charged particles attach themselves to the positively charged macromolecules, and as a result flakes are formed. The size of these flakes depends on the length of the polymer molecules; the longer they are, the better such a flocculating agent functions. Recently the Teltow Fraunhofer team succeeded in developing branched cationic polyelectrolytes. These make it possible to improve the degree of separation even more. For example, the waste water from charcoal briquette plants can be cleaned with branched polyelectrolytes. The usable coal is separated out, and what is left is usable, cleansed water which can be used again.

Poisons seldom occur in isolation. In order to clean water completely different polymers with different baits must often be employed. The secret of polymer researchers is developing the right molecular structure for every problem. And that is why there is no patent formula to apply to environmental toxins. "Every kind of water is different," acknowledged Jaeger, who is confronted every day with the waste water problems of large and small industrial businesses and of communities. "It's true that we can turn to a basic technology to come to grips with the problems, but then we have to develop a special formula each time."

The Fraunhofer researchers have formulae for problems of quite a different kind. Flocculation agents can also be used to shorten the sedimentation periods in obtaining ores and to purify salt solutions in obtaining potash salt, to separate oil emulsions in petroleum processing and to accelerate drainage in paper production. A whole list of additional applications can be imagined. One of them is a surface covering which also components and sheet metal temporarily.

Such a process was recently developed at the Fraunhofer Institute in Teltow, a process which protects sheet metal which has to be stored before further processing from corrosion. Previously, such sheet metal was greased. That had the disadvantage that after the sheet metal was cleaned the grease got into the waste water and had to be laboriously separated out again with a grease extractor. This expense is avoided if partially water-soluble polymers are used instead of grease. Such mildly basic polymers are

insoluble in the neutral pH range, and thus in rainwater. "They surround the sheet metal and components like a raincoat which not a single drop of water can penetrate," explains project director Dr. Matthias Hahn. If the sheet metal is to be reprocessed, the polymer layer is washed off with lye—the coating dissolves in the basic pH range. This solute is then captured and neutralized with acid. In the neutral pH range the polymers are again precipitated and can be filtered and reintroduced into the process.

Water-soluble polymers are already being used in various branches of industry. In the textile industry and in bulk cleaning, articles of clothing are coated to prevent electrostatic charge—and thus the notorious static cling. Shampoo manufacturers mix ionized, water-soluble polymers into their formulas in order to avoid giving the hair an electric charge and thus an undesirable fright-wig hairdo.

Nothing can be done these days without polymers. We use them for hair, for textiles and paper, we take them in as preservatives in foods and we drink water that has been purified with polymers. The multiplicity of the applications makes water-soluble polymers the material of the future. Worldwide more than a million tons of water-soluble polymers are already being produced and processed every year. The trend is growing, especially in environmental protection.

Plastic Used To Filter Harmful Ozone

94WN0414B Duesseldorf VDI NACHRICHTEN
in German No 34, 26 Aug 94 p 4

[Article by Juergen Siebenlist: "Plastic Consumes Harmful Ozone"]

[FBIS Translated Text] Hoechst researchers have developed a promising filter medium.

Frankfurt. Hoechst AG is currently producing in small pilot production the first batches of an ozone-consuming plastic. Researchers at the chemical company have succeeded in getting "noXon"—as the new filter material is called—out of the laboratory (and into test use) by only a year and a half after its discovery.

Researchers at Hoechst AG in Frankfurt have developed a plastic that completely transforms the respiratory irritant ozone, made up of three oxygen atoms (O₃), into "normal" life-dependent oxygen molecules consisting of only two oxygen atoms each.

The thermoplastically processible filter material named "noXon" can, according to Dr. Hartmut Vennen, completely free air and water of ozone and can neutralize up to 40 percent of its own weight in this harmful substance. According to the spokesman on the Hoechst research, this can be achieved by merely passing the room temperature [ozone-] laden air through the plastic filter, which can be made as a granulate, a woven fabric or a non-woven fabric. No ozone will be detectable on the reverse side [of the filter].

According to statements from Hoechst, tests indicate that actually more than 1.5 million times the level of the ozone guide value of 120 micrograms/m³ is reliably and completely destroyed. In each case, noXon consumes only one oxygen atom from the ozone molecule and holds this [atom] in its own chemical bond until the plastic is fully oxidized. The material does not pose a danger to users or to the environment throughout this process. In contrast to activated charcoal filters, for example, which may explode under certain conditions, noXon can be used even with ozone concentrations up to the explosive limit (15 volume percent). In addition, exhausted filter material can be regenerated in a few procedural steps—for example, by heating—and thus be reused. Filter material which can no longer be rejuvenated or is destroyed can still be further recycled without problem.

Since ozone is difficult for the activated charcoal filters [to handle], Hoechst sees one particular area of application in the combination of both filter materials. In all currently existing filter set-ups based on activated charcoal, both of the materials could complement each other synergistically. According to Dr. Vennen, if a noXon filter is placed in front of a conventional filter, the combination filter has, for example, an appreciably extended service life. In addition, the research spokesman also sees an enormous applications advantage in the fact that the plastic attacks practically nothing but the ozone molecule. While this is completely filtered off, other gas components can pass through the noXon blockade almost unimpeded. Thus, it could be developed in combination with activated charcoal into a more efficient filter for benzene. Emissions of this hydrocarbon molecule are paid almost as much attention by Germany's Federal Ministry for Environmental Protection as the surface ozone, which this summer was watched by everyone.

Since Hoechst is now able after only one and a half years in development to produce the first larger quantities of noXon in a pilot production in the main Frankfurt plant, Dr. Vennen calculates that in another one to one and a half years filter manufacturers will put the first usable products on the market. Reaction from customers—particularly from filter manufacturers and water treatment companies—is already very good.

Other possible uses for the new material are obvious: the plastic can be usefully employed wherever people suffer from the irritating effects of ozone. In the future, for example, climate control systems in hospitals, schools and office buildings as well as in motor vehicles and airplanes could be outfitted with ozone filters.

Treatment of Clear Sludge From Power Plants Described

94WN0414A Duesseldorf VDI NACHRICHTEN
in German No 35, 2 Sep 94 p 18

[Article by Rainer Antkowiak: "Clear Sludge in Power Plants"]

[FBIS Translated Text] *Co-combustion of sludge in coal-fired power plants does not raise emissions.*

Co-combustion of clear sludges in power plants is a disputed topic because of the possibility of increased emissions. Test results so far indicate that emissions do not increase because of the sludge.

The accumulation of clear sludge keeps growing steadily: according to the Federal Environmental Protection Agency (UBA) in Berlin, roughly 50 million metric tons are produced in Germany annually. Two thirds of it ends up in landfills. The UBA expects an increase from the current 4.2 million metric tons of dry matter (DM) per year to 6 million metric tons DM in the year 2000. Bottle necks in disposal can thus not be ruled out for the near future.

These developments speak in favor of alternative methods of sludge disposal, such as co-combustion of sludge in power plants. "In two to three years, co-combustion will be more economical than dumping [sludge] in a landfill." That is the view of Wolf Schultess, publicly appointed and sworn expert on air pollution prevention from the Karlsruhe IHK [Chamber of Industry and Commerce]. In a study commissioned by the Raab Karcher Kohle GmbH in Essen entitled "Co-combustion of Clear Sludge in Coal Furnaces," he comes to the conclusion that technically irreproachable, economical and environmentally sound disposal is possible in power plants. Schultess points out, "Because of the varying composition of clear sludges and the numerous marginal conditions which have an effect, every plan for clear sludge co-combustion has to be looked at as unique onto itself."

Concerning the average emissions from such plants, the study indicates that nitrous oxide formation is little influenced by coal and clear sludge mixed furnaces compared with pure coal furnaces. Emissions of sulphur dioxide (SO₂) drop, since clear sludges usually contain less sulphur than do coals. On the other hand, the level of heavy metals like arsenic, thallium and mercury which are gaseous at high temperatures goes up. Schultess: "We must therefore pay special attention to the mercury levels of the clear sludge." The concentration of organic pollutants in the flue gas is comparable to that of a pure coal furnace. In mixed furnaces containing relatively high levels of sulphur dioxide, the formation of dioxins and furans is suppressed by the action of the SO₂. "But these are experimental values," explains Schultess, "which are far from being accounted for scientifically."

After one mechanical dewatering, clear sludges have a DM content of 40 to 50 percent and typically a heating value of 1.5 to 3 kWh/kg. With 90 percent DM the heating value increases to 4 to 6 kWh/kg. "At this point the combustion behavior of dried clear sludge approaches that of brown coal," according to Schultess. If in coal furnaces the share of thermal output from the clear sludge is kept to less than 5 percent of the furnace's thermal output per boiler unit, sludge with a DM content of 40 percent can be used for co-combustion in every

type of furnace without any problem. The co-combustion of clear sludges in slag-tap-fired furnaces is considered especially advantageous, since here most of the ashes and the heavy metals are melted down into a vitrified granulate. The issue of cost, according to Schultess, also speaks in favor of clear sludge co-combustion. In medium sized plants which get five percent of their furnace output from sludge, the costs are between 20 to 100 German marks per metric ton of clear sludge. This compares with approximately 400 German marks per metric ton for pure sludge combustion.

With larger sludge portions, the question is first and foremost one of emissions. In principle, the emission limits contained in the regulation on solid waste incinerators (17th BImSchV) [Federal Air Pollution Control Regulation] apply to a clear sludge admixture of up to 25 percent of the furnace's thermal output. The actual waste gas limits must be determined by means of proportional calculation: for the portion of waste gas from the clear sludge, the limits of the 17th BImSchV apply; for the portion from the coal, those of the 13th BImSchV. "New" for the power plant operator are the limits in mixed furnaces for dioxins/furans and heavy metals which become valid through the 17th BImSchV. If more than 25 percent clear sludge is burned in the furnace, the more stringent limits of the 17th BImSchV for total waste gas take effect—the power plant becomes a waste incinerator.

As Schultess further reports, however, application of the 17th BImSchV to co-combustion of up to 25 percent clear sludge can also be suspended or limited: "Examples from the paper industry show that the authorizing agencies for such projects dispense with requirements or standards which exceed those of the TA Air [Technical Instructions for Preserving Air Quality] or those of the 13th BImSchV."

Although co-combustion of clear sludge would ease the burden on many landfills and would technically cause no special difficulties, most power plant operators shy away from it. The single power plant currently using clear sludge for co-combustion for continuous operation is on the grounds of BASF [Baden Aniline and Soda Factory] in Ludwigshafen. Since 1984 they have been drying clear sludge here in a drum dryer until it is 90 to 95 percent DM, grinding it in a bowl mill to a granulate and burning it in the burners of a slag-tap-fired boiler on a level of magnitude of 20 to 30 percent of the total furnace output.

Duesseldorf is looking ahead with municipal power plants. Since last year and on a test basis the Duesseldorf Lausward power plant has been using sludge from a nearby sewage treatment plant for co-combustion—a total of 5,000 metric tons so far. Since then, one of 4 slag-tap-fired boilers has been fueled with [a mixture of] coal and 25 percent dried clear sludge. Gerhard Hansmann, Director of Environmental Engineering at Duesseldorf's Department of Works, says, "Extensive testing proves that co-combustion [of sludge] does not have a detrimental effect on emissions from power plants." Currently, the approval

process is in the works for continuous operation in which 25,000 metric tons of dried sludge would be burned annually. This will enable all the Duesseldorf sewage treatment plants to dispose of their [sludge] waste.

The test operation at the Saarberwerke AG Weyher power plant arrived at similar results. Dried sludge (10 percent residual moisture) is used here in co-combustion in a slag-tap-fired furnace. The energy level of the clear sludge is less than 25 percent of the heat output of the furnace. According to Schultess, the plant operator has come to an agreement with the authorizing agency for a two year test run, during which any changes in emissions from the previous form of operation are to be registered and analyzed. "So far no significant changes in emissions have been detected."

Photo Caption

1. p. 18: In the Duesseldorf Lausward power plant, 25,000 metric tons of dried clear sludge are to be used in co-combustion annually by 1995. That corresponds to the amount of sludge which is accumulated by all of the Duesseldorf sewage treatment plants. Photo: Duesseldorf City Works

ITALY

Reduction of Carbon Dioxide Emissions in Italy Studied

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[Article by Giancarlo Tosato, of ENEA [National Agency for New Technologies, Energy and the Environment], Department of Energy: "Reduction of CO₂ Emissions in Italy"]

[FBIS Translated Text] *Strategic and cost analyses of the Italian energy supply and demand system, using the Markal-Italia linear planning model and a preliminary version of the technologies database.*¹

Problem of Climatic Changes

For years, global climate experts have been trying to clarify the anything but simple connection between the concentration of certain gases in the terrestrial atmosphere and climate. Pending a scientific demonstration of the existence of the greenhouse effect—namely, that a rise in the concentration of carbon dioxide, methane, nitrogen dioxide, volatile organic compounds, chlorofluorocarbons, and other gases, in the atmosphere, leads to climatic changes, the first of which is a rise in the mean temperature—the governmental authorities of almost all of the world's countries have agreed on the desirability of slowing the rise of concentration of these gases, as a precautionary measure, by reducing their emission levels relative to the prevailing trend lines.

At the UN's June 1992 Rio de Janeiro Conference, therefore, 143 countries signed a framework convention relative

to climatic changes. The convention calls for each signatory to institute "national programs to implement measures designed to mitigate climatic changes, taking into account the emissions (...) of all the gases involved in the greenhouse effect that were not included in the Montreal protocol (...)" (art. 4, 1-b of the agreement), and "to adopt national policies and implement measures relative thereto to mitigate climatic changes, by limiting the emissions, caused by humans, of gases that contribute to the greenhouse effect (...) and recognizing that a return by the end of the current decade to previous levels of emission (...) of carbon dioxide and other greenhouse-effect gases not included in the Montreal protocol would contribute to modifying the long-term trend" (art. 4, 2-a).

Pending clarification of the climatic aspects, the economic experts of the various countries have, for years, been addressing the question of the economic impact of the greenhouse effect, and seeking to determine which "insurance policy" best minimizes the risk. Some try to estimate what the costs or benefits to each country would be were the greenhouse effect to become pronounced to a greater or lesser degree. A second group of studies, including this one, calculate the cost of reducing greenhouse-gas emissions to different extents. In neither of the two cases, despite the numerousness and authoritativeness of the studies effected, have positions of consensus been reached.

Responsive Policies in Energy Sector

If greenhouse-gas emissions must be reduced relative to current trends, the options governing the development of those sectors of activities that produce the emissions must be changed. Since the gases most responsible for the greenhouse effect are emitted by the energy system, the responsive policies and national intervention plans that each of the convention signatories is committed to institute must essentially address the signatory's energy policy options.²

Stated somewhat simply, the energy system's CO₂ emissions can be reduced by:

- a. Reducing economic growth;
- b. Lowering the end-user demand for energy commensurately with the rate of economic growth;
- c. Diminishing specifically the energy supply system's CO₂ emission commensurately with the end-user demand for energy.

The debate in progress among the analysts of the various countries seeks to clarify the level to which it is possible to reduce CO₂ emissions by means of energy supply system improvements (point c. above) and demand system improvements (point b.), without provoking a reduction of economic growth (point a.), but by modifying the technological system.

The discussions relative to supply sector options revolve around the amount of usable natural gas, the use of nuclear energy, and the potential for producing electricity and

fuels from renewable sources, account being taken of costs and benefits in terms of resupply and environmental security.

The discussions relative to demand sector options revolve around more efficient technologies, the use of which, for example, leads to improving the heat insulation of buildings, to introducing renewable technologies to the end users, to disseminating collective transport methods, and even to studying to what extent the growth of productive economic sectors can be decoupled from the energy demand.

Once the technological and regulatory options have been defined, an initial evaluation seeks to estimate the magnitude of the obtainable reduction of CO₂ emissions based only on those options that present a positive economic balance in a cost-vs-benefits analysis that includes energy and other internal and external elements, but not the array of environmental externalities connected with the greenhouse effect ("no-regret" options).

According to many experts, however, the stabilization (and even more so, the reduction) of CO₂ emissions is possible only by putting in place all of the technical and organizational options already available or in the course of research and development, including those whose costs are greater than their direct economic benefits. These experts hold that the use of such options will result in future economic benefits of an environmental type that will outweigh their present-day economic costs. If use is made of such options to modify the evolution of the energy system, the reduction of CO₂ emissions relative to an undisturbed tendential evolution becomes a cost for the national economic system. And it is the total of that cost (or benefit) that is being addressed by the debate, to which it is the intent of this study to also contribute.³

Evaluation Methodologies

The cost level indicated by the experts depends on objective facts such as the region of the globe to which they apply; but that is not all. As things stand at present, the calculated values appear to also depend substantially on subjective factors, such as the type and number of options taken into consideration, or the computing method used.

All the studies in this sector have a logical part in common. To calculate by how much, by means of what political measures, and at what cost, emissions can be reduced, a comparison of emissions and costs is made between a tendential scenario and a scenario involving intervention. A scenario is understood herein to be a coherent calculation, made by means of mathematical models, as to how the sector that emits greenhouse gases may develop in the future. The term "tendential scenarios" is applied to those that extrapolate the dynamics of use of the technologies in place as of past years to the present, without provision for intervention in the form of discontinuous improvements in the efficiency of the energy technologies involved, especially in the end-user facilities sector.

It is with respect to the economic significance and manner of constructing the scenarios involving intervention that scholars differ. An initial categorization of the methods of constructing scenarios goes back to the theories of economic mathematics and tends to distinguish least-cost scenarios and those of general economic equilibrium from scenarios of the econometric type. As to manner, scenarios can essentially be divided into two categories. The top-down method utilizes, for the most part, scenarios constructed by means of macroeconomic models, in which more or less aggregated economic variables (gross domestic product, values added, indexes of prices, capital, labor, etc) are modified with time in different ways depending on the manner in which the traditional tools of economic policy (taxes, incentives, credit, etc.) are applied to the exogenous variables. The bottom-up method utilizes, for the most part, scenarios constructed with technological models, in which costs and quantities of the variations in emission are calculated on the basis of the makeup of the energy technologies that produce them. Use of a bottom-up technological model such as the Markal model has the advantage, relative to top-down econometric models, of identifying not only the prices of partial equilibrium but also the technological options that determine them, which is necessary in the subsequent planning phase. On the other hand, the substitution costs calculated using technological models are systematically lower than those calculated by means of top-down models, because they neglect the indirect or induced costs at least in part.

In this context, the term "technology" is intended to designate neither a specific model of equipment (as for example, a Fiat Tipo, a 3-star Rex combination refrigerator, a Riva Calzoni 30 kW wind-driven generator, a specific gas turbine under study at ABB [Asea Brown Boveri]), nor a technological category (as for example, automotive road vehicles, household appliances, renewable-source generators of electricity, thermoelectric power plants), but rather something in between (such as gasoline-powered automotive vehicles of average cylinder-capacity currently on the market; high-quality refrigerators on the market; existent low-power, horizontal-axle, wind-driven generators; a combined-cycle thermoelectric power plant in the process of commercial demonstration). In addition, the expression "energy technology" is meant to indicate all systems whose inputs and/or outputs are an energy carrier or energy service, characterizable by costs and efficiencies.

This Study

In line with this second methodological approach, the study that is the subject of this article has as its objective an analysis of the possible medium-to-long term responses of the national energy demand and supply system to the CO₂ emission stabilization (and reduction) constraints, in terms both of change of the technologies of use and conversion of energy, and of modification of energy sector costs, assuming optimal (least-cost) behavior of the markets.

Using Markal software⁴, a bottom-up model⁵ of the national energy system was constructed, based on:

- demand and supply technologies;
- disaggregated demand for energy services;
- prices of energy carriers.

The method used in the present study presents numerous advantages. Relative to the traditional method of cost-benefit analysis of individual options, use of the Markal method has the advantage of calculating the rate of penetration of each technology in individual energy-carrier or energy-services markets and the relative rates of domestic yield, taking into account price changes of individual energy goods or services induced by the use of the technologies concerned. In other words, account is taken of the fact that by using a technology with lower production costs, the price of the energy carrier or service produced is modified and in turn modifies the terms of the cost-benefits analysis.

The national energy supply and demand system was represented by an RES [Reference Energy System] graph for each five-year period included in the scope of this analysis (1990 to 2030). The graph represents in extreme detail the flows of all the energy carriers accounted for in the national statistics, as well as the operation of the technologies of energy transformation and use.⁶ For the moment, the scenarios studied include neither the nuclear option nor removal of carbon (by pumping into the ocean or into abandoned hydrocarbon deposits) or its biological fixation. The data on the technologies that model the national energy system, from which the preliminary estimates used in this study are derived, are drawn from Italian and foreign statistics and publications.

The national energy system development options were analyzed by evolving the energy model through nine discrete 5-year periods between the current situation and the year 2030. Taken together as a coherent whole, the exogenous demand assumptions (projections), the rules of evolution of the system with time, and the endogenously calculated results of the model, constitute in this case a scenario. And the national energy system development options are studied by calculating, by means of the model, the costs, consumptions, and emissions relative to various exogenous assumptions.

In each scenario, a discount rate of 6 percent in real terms was assumed. In this study, four groups of scenarios were explored initially, differentiated on the basis of behavior-versus-time of the exogenous goods-and-services-demand (high or low), and of the absolute and relative exogenous prices of the energy carriers (crude oil, natural gas, petroleum products, coal, electrical energy, etc.). Having found, after the initial calculations, that the scenarios developed with diverse evolutions of energy prices exhibited only minor differences as compared to scenario differences induced by environmental constraints, a single behavioral pattern was chosen for the evolution of absolute and relative prices of imported energy carriers. A crude oil price of \$20 per barrel was assumed from 1990 to year 2000, with an annual rise of \$1 per barrel thereafter.

In contrast, the results of the model were found to be highly sensitive to the exogenous assumption as to economic evolution. In the initial phase of the study, strong economic growth was assumed: a GDP average annual growth [AAG] of 3 percent to year 2000, 2.5 percent AAG to 2010, and 2 percent AAG thereafter. In the current phase of the study, a scenario with more limited economic growth was assumed as a base case: +2 percent AAG to 2000, +1.2 percent AAG to 2010, and +0.5 percent AAG thereafter. A high rate of economic growth was assumed in only one scenario, namely, that in which it was sought to obtain primary-energy consumption results in line with the assumptions made in the 1988 National Energy Plan (PEN '88).

Tendential Scenario Indications

In the tendential scenario based on strong economic growth, the total primary-energy requirement (TPER) calculated from the model for year 2000 is 184 Mtep [million tons oil-equivalent]; that is, within the interval taken into consideration by PEN '88 (see Fig. 1 [not reproduced]). The electrical energy requirement within the network rises to a value of 310 TWh [terawatt hours] annually in year 2000, accounting for 38.6 percent of the TPER, only slightly less than the values found in PEN '88 (315 TWh/year and 40.2 percent, respectively).

It is interesting to note the change that comes about in the electrical intensity parameter, defined here as the difference between annual mean rates of variation of GDP and of the electrical energy requirement. The electrical intensity of revenue was 0.9 during the period 1983-1990, and 0.5 during the 1980-1990 10-year period. If FEN '88 remains as the year 2000 objective, the electrical intensity must remain at zero beginning in 1990, so as to produce an electrical energy demand growth equal to that of the GDP (3 percent). It is also interesting to note that this assumption, already a reductive one relative to prior electrical energy plans, leads to incongruities when inserted into a technological model of the type used for this analysis, in which the number of end-use devices necessary to sustain electrical demand must be indicated. Actually, it was found that the size and number of such devices would have to increase beyond the saturation level. To avoid this, the electrical intensity must be further reduced to the value of -0.2.

In the tendential high-growth scenario, the elasticity of the primary energy requirement [PER] relative to revenue during the period 1990-2000 is 0.3⁷ (0.24 in the tendential low-growth scenario); it drops to 0.30 (-0.15) in the succeeding 10 years, when the energy demand sectors' conservation options come into play. It is to be noted that in the unconstrained tendential scenarios, governed solely by direct prices, the elasticities of CO₂ emissions relative to revenue exceed those relative to primary energy throughout the time span covered by this study, because the proportion of primary energy of fossil origin increases, and because among the fossil fuels the proportion of coal increases more than does that of gas.

In the tendential high-growth scenario, it is assumed that GDP grows from 1.31 quadrillion lire⁷ in 1990 to 1.76 quadrillion in 2000, or 160 trillion more than in the tendential low-growth scenario. According to the model, the required outlay to satisfy the high-growth scenario's highest energy-demand level absorbs approximately one fourth of the incremental GDP produced in the high-growth scenario, as follows: 2 trillion (not including taxes) to acquire more fuels, 5 trillion in the energy supply sector (40 percent of which consist of annualized investments), 30 trillion in the demand sector, to enable the users (families and productive sectors) to acquire the necessary additional end-use devices.

In the high-growth scenario the energy system emits approximately 485 Mt [million tons] of CO₂ at year 2000, or 20 Mt of CO₂ more than in the low-growth scenario). The outlay necessary to contain the high-growth scenario emissions at the low-growth scenario level—an outlay that in a stabilization context takes another slice out of the high-growth scenario's incremental GDP—depends on the unit cost of the emissions thus avoided. If it is assumed that the average cost of substitution of a ton of CO₂ is equal to that calculated to stabilize emissions in the case of low economic growth (34 lire/kg CO₂, see Fig. 3 [not reproduced]), then the average annual economic cost of reducing high-growth scenario emissions to the low-growth scenario level will be 700 billion as of year 2000, with costs incurred over the period between now and year 2000 totaling on the order of 2 trillion. Since the objective would be to reduce emissions by an amount exceeding the reduction necessary for stabilization on the basis of the low-growth case, it seems more appropriate to assume a higher value of average cost (approximately 110 lire/kg CO₂). The annual cost of stabilization, starting from a higher-growth scenario, would then come to at least 2-3 trillion lire as of year 2000, and add up to a total of at least 8-10 trillion over the period between now and year 2000.

Benefits of Least-Cost Scenarios: Economically Valid (No-Regret) Options

An initial intervention to reduce greenhouse-gas emissions consists of improving the economic efficiency of the market, so that economic growth will tend to optimize the situation of the system. Limiting our assumption to the case of low economic growth, it was seen that the curve of CO₂ emissions in the least-cost scenario is higher than in the tendential scenario (see Fig. 2 [not reproduced]). In other words, investing in technologies that present a current positive net economic value—based on a cost-benefits analysis that does not take into account the greenhouse effect among its environmental externalities—initial reductions are obtained with respect to CO₂ emissions (in the amount of 13-18 Mt of CO₂ annually from year 2000 onward), equivalent primary energy (in the amount of approximately 4 Mtep annually during the period 2000-2010), and energy system costs (in the amount of 6-7 trillion lire annually as of around year 2000, and three times that amount in the years thereafter) relative to tendential-growth scenarios. The phenomenon can be described in both macroeconomic and technological terms.

In the terminology used in models of the econometric type or in aggregated optimization models (in which improvement of the system's efficiency to economic optimum is summarized in a single parameter), the energy system presents a primary-energy AEEI [Autonomous Energy Efficiency Improvement] on the order of 1.6 over the long term (1.1 in the intermediate term, until 2010). The same parameter relative to final [end-use] energy drops to 1.4 (1.0 intermediate-term), and even lower relative to useful energy (0.5 long-term, 0.8 intermediate-term).

In aggregated terms, the elasticity of energy-services demand relative to revenue remains practically unaltered in both scenarios (0.5 until year 2000, 0.6 from 2000 to 2010). At the sectorial level, until year 2000, energy-services demand rises at a rate only slightly below that of revenue in the transportation sector (an average of 1.6 percent annually in both scenarios, versus a 1.9 percent growth of GDP), slightly over half that rate in the residential and commercial sector (1.1 percent annually), and less than a fourth in the industrial sector (0.45 percent annually) pursuant to an austere industrial restructuring in favor of the sectors requiring less energy.

The elasticity of final-energy-equivalent consumption relative to energy-services demand changes, however, from 0.63 in the tendential case to 0.43 in the least-cost case during the period until year 2000. In particular, the growth rate to year 2000 drops considerably as regards final-energy-equivalent consumption in the transportation sector (from 1.1 to 0.8), less in the residential and commercial sector (from 1.0 to 0.8) and the industrial sector (from +0.1 to -0.1).

Improvement of efficiency in the energy production and transformation sector is found to be rather limited. All things considered, in the least-cost scenario, the primary-energy intensity drops to -1.7 with a substantial decoupling of growth of energy consumption from growth of revenue. A lesser decoupling also occurs in the case of electrical energy, whose intensity during the 1990-2000 period drops below the -1.0 level.

Stabilization Options and Costs

If carbon dioxide emission is not penalized or constrained, the least-cost evolution of the energy system entails, according to the model, an annual increase of 30 Mt of CO₂ emission in year 2000 with respect to that of 1990 (and an increase of approximately 20 Mt of CO₂ emission annually in 2010 with respect to the 1990 level; see Fig. 2), with an average annual growth rate of 0.6 percent. Which options permit corresponding emission reductions, without penalizing economic growth a priori, and at what cost?

Depending on where they are placed in the chain that links the emissions curve to that of revenue, the reduction options can be grouped on the basis of the economic phenomena that contribute to the decoupling of:

1. Energy services demand from revenue;
2. End-use energy consumption from energy services;

3. Total primary-energy requirement from end-use energy consumption;
4. Quantity of fossil fuels used from total primary-energy requirement;
5. CO₂ emissions from quantity of fossil fuels.

Energy-Services Demand

The dependence of energy-services demand upon revenue through spot-market prices is only partially included in the model. While the end-user demand for goods and services is substantially exogenous and dependent solely on revenue and the population, the levels of activity of the productive system depend at least in part upon energy prices.

The model therefore reproduces the system's fundamental behavior, that is, the "natural" evolution of the productive system toward the sectors that require less energy (altogether, the elasticity of energy-services demand relative to revenue is 0.5 for the 10-year period 1990-2000 and 0.6 in the succeeding 10-year period), but not its substantial change if the stabilization constraint is imposed upon it.

Since, in reality, end-user preferences as well as the levels of activity of the productive system change with price changes (designed to reduce such production and consumption as contribute most to the emission of CO₂, and hence cost more), the values of stabilization costs calculated in the present study are to be considered as upper limits, if the included technological options are accepted.

End-Use Energy Consumption

The pool of installed energy-consuming end-use devices that furnish users with energy services they need, can evolve in different ways depending on objectives. If the objective is stabilization rather than least cost, the end-use sectors contribute to the extent of 22 percent to the reduction of CO₂ emissions in year 2000 (17 percent in 2010), or the equivalent of 6.5 Mt of CO₂ annually at year 2000.

In the civil sector (residential and commercial), which contributes to the extent of three fourths to the reduction of emissions, the contributions to the improvement of efficiency come from:

- use of more efficient electrical devices (electric light bulbs, various household appliances);
- upgrading of the heat insulation of buildings to the level of that of new buildings, together with conversion to individualized heating control in the case of multi-family buildings;
- renovation of the pool of installed boilers with new high-efficiency systems.

In the industrial sector, the major contributions to the reduction of emissions come from the sectors that use heat-processing techniques, and is obtained through the use of more-efficient ovens and boilers. It does not

appear necessary, however, to resort to costly interventions relative to the transportation infrastructure to achieve stabilization.

The acquisition of more-efficient end-use devices, especially in the residential and commercial sectors, increases the total annual cost of the energy end-use sectors by 970 billion lire a year. With investments of this order of magnitude, even in the presence of equal energy-services demand, end-use energy consumption as of year 2000 can be reduced by 1.53 Mtep annually (equal to 3 percent of the residential and commercial sector's end-use consumption) equivalent to a TPER saving of 2.58 Mtep annually.

The disadvantage of these options lies in the high unit cost (almost 150 lire/kg of CO₂). The advantage lies in their structural nature, which introduces a permanent increase in the efficiency of energy-use, and incremental employment and revenue, thus stimulating the purchase of durable goods.

Total Primary-Energy Requirement

The energy sector, that which includes the transformation and production of energy for the end users, is required to supply less end-use energy if the stabilization constraint is imposed upon it.

Besides diminishing as a result of improved end-use efficiency, the primary-energy requirement further decreases with improved efficiency of the energy sector itself. In the electrical sector, the proportion of cogeneration of electricity and heat increases and, concomitantly, a slow penetration of remote heating takes place in the medium-sized urban agglomerations.

Within the bounds of a certain approximation, it can be said that improvement of energy-sector efficiency contributes to the extent of 5 percent to the stabilization of emissions as of year 2000 (21 percent in 2010), equivalent to a reduction of 1.5 Mt of CO₂ emission annually around year 2000.

Contribution of Renewables

To achieve stabilization by year 2000, with respect to the basic least-cost case, energy production from renewable sources must be increased by 1.4 Mtep annually: 0.1 Mtep annually from waste (chiefly biogas); 0.25 TWhr annually from geothermal sources; 5.3 TWhr annually from hydroelectric sources (this does not take into account, of course, that the governmental administration concerned currently grants the required licenses with delays measured in lustrums!).

Use of renewable sources further reduces CO₂ emissions by approximately 3.6 Mt annually as of year 2000 in the least-cost case (equal to 12 percent in year 2000 and 17 percent in year 2010). The necessary installations add a further cost increase of 460 billion lire annually to year 2000 (85 percent comprised of annualized investments). The average unit cost of this option is almost 130 lire/kg of CO₂.

Contribution of Methane

With an option based on the economic conjuncture, such as the substitution of a slightly smaller amount of natural gas for approximately 10 Mtep annually of solid fossil fuels in the electric power generating plants (see Table 1), a larger reduction of emissions is obtained with respect to the least-cost case: 60 percent as of year 2000 (45 percent as of 2010), equal to a reduction of 18.3 Mt of CO₂ annually as of year 2000 (9.0 percent as of 2010).

Table 1.—Summary Balance Sheet of Energy in Italy in Case of Stabilization (Low Demand, Low Level of International Trade, Low Prices, Discount Rate at 6 Percent, Case LL6BS) as of Year 2000

(In Mtep)3	Solid Fossils	Gaseous Fossils	Liquid Fossils	Electrical Energy	Heat	Biomass	Total
Primary production	0	17	5	11.72	0.15	2.54	36.41
Import	16.69	43.31	68.45	3	0	0.38	131.83
Export	0.1	0	0	0	0	0	0.1
Stores variation	0	0	0	0	0	0	0
Gross domestic consumption	16.59	63.31*	73.45	14.72	0.15	2.92	168.14
Consumption and losses	-0.6	0	-6.32	-36.31	-0.46	0	-43.7
Thermoelectric plants	-11.19	-22.36	-10.09	41.23	2.92	0	0.51
Other processes O-I	0.04	0.83	-0.35	0	0	-0.04	0.48
End uses	4.84	38.78	56.68	19.63	2.61	2.88	125.17
Industry	3.33	15.4	3.97	10.34	2.15	0.1	35.04
Transport	0	0.4	35.06	1.02	0	0.03	36.5
Other energy uses	1.04	21.05	9.76	8.28	0.46	2.75	43.33
Other non energy uses	0.47	1.93	5.2	0	0	0	7.6
Domestic bunkering	0	0	2.7	0	0	0	2.7

*[as published]

The increased annual cost, estimated at 230 billion lire annually around year 2000 based on the prices projected by the model, depends substantially on the course of international prices. The advantage of this option lies unquestionably in its low unit cost (12.6 lire/kg of CO₂ and in its broad potential. The disadvantage appears to consist of its nonstructural nature, which contributes neither to permanently modifying the energy system nor to stimulating employment and domestic revenues through the required investments.

Unit Costs

Altogether, according to the estimates provided by the model, the stabilization of CO₂ emissions by the national energy system at the 1990 level (418.5 Mt of CO₂ annually), with respect to the least-cost no-regret case entails a reduction of almost 30 Mt of CO₂ emissions annually as of year 2000 (see Fig. 2) and an incremental cost of 1 trillion lire (85 percent of which consists of annualized investments).

Considering the sum of the annual emissions to be reduced within the time span between now and year 2000, the total economic cost of the stabilization operation can be put at approximately 5 trillion lire, more than

80 percent of which will go to investments or the acquisition of durable goods.

Corresponding to an average stabilization cost of 34 lire/kg of CO₂ is a marginal cost of approximately 110 lire/kg of CO₂, around year 2000 (see Fig. 3 [not reproduced]).

International Comparisons and Lines of Research

The value of the marginal cost of stabilization calculated here falls within the lower range relative to those calculated, using the same methodology, by other national and local entities (see Fig. 4 [not reproduced]), and taken from an analysis developed under the aegis of the International Energy Agency.⁸ The differences are only partially explained by the different starting situations of the respective energy systems (shown in Table 2). The different values of marginal cost stem mainly from the assumptions made as to growth of the energy systems (growth of demand, political and/or administrative constraints, availability of resources, etc.) and the manner in which the systems are schematized within the model (technological options taken into consideration, their technico-economic characterization, their approximations, etc.).

Table 2—Emission Indicators by Country in 1990

Country/Region	Annual Yield Per Capita	Annual Primary Energy Intensity Per Capita	CO ₂ Per Capita	CO ₂ Per Unit of GDP	Ratio of Fossil Fuel Use to TPER	CO ₂ Intensity per TPER
Unit	Thousand 1990 U.S.\$/p	MJ/1990 U.S.\$	Tons CO ₂ /per	Kg CO ₂ /§	Percent	Tons CO ₂ /TJ
Belgium	19.5	10.1	10.5	0.54	80	53.2
Japan	23.1	6.6	9.1	0.39	85	59.8
Italy*	17.5	6.8	7.9	0.45	90	66.6
Norway	24.9	14.6	8.3	0.33	32	22.9
Netherlands	16.8	11.7	10.8	0.64	97	54.9
Ontario (Canada)	24.8	13.4	14.1	0.57	72	42.4
Quebec (Canada)	20	17.9	9.6	0.48	36	26.9
United States	22	15	19.5	0.89	85	59
Sweden	26.4	9.1	6.3	0.24	34	26.2
Switzerland	29.1	5.8	6.4	0.22	54	38.3

*For CO₂ emissions, the value of 456 Mt (relative to 1989) was used. This value was taken from the Second Report on the State of the Environment published by the Ministry of Environment toward the end of 1992.

From an analysis of the work done in Italy thus far, and from a comparison with what has been undertaken in other countries, there emerge a few developmental lines for the course of research in the sector of evaluation of response policies. In addition to improving the database that characterizes the energy system of reference currently in use, least-cost analyses will be carried out using reference energy systems that are more disaggregated, particularly in the demand sectors, verifying and updating data and results with sectorial experts. In the subsequent phase, plans call for extending these analyses

to the macroeconomic implications, by extending the instruments of computation to general-equilibrium non-linear-programming models.

To proceed from identification of the most promising technological and political options emerging from these analyses toward their practical implementation requires a more detailed study. The pros and cons of each option must be evaluated with more detailed cost-vs-benefits analyses that consider all the externalities, including the environmental and administrative ones.

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Footnotes

1. The present article synthesizes the content of an ENEA [National Agency for New Technologies, Energy and the Environment] document bearing the same title and produced in May 1993, that describes the techniques used to carry out the reference study and reports the model's most significant numerical input and output data.

2. To sustain, add depth to, and define in greater detail the national debate on response policies, the ENEA formed, in 1992, a study group on "Options for the Stabilization of the Global Climate," coordinated by Engineer Giancarlo Pinchera. Within the scope of this study, the ENEA analyzed particular aspects of thematic and systemic nature, producing, in addition to the present study, the following reports:

—"Analysis of the Technological Options for Reducing Carbon Dioxide Emissions in the Energy-Intensive Industrial and Energy Production Sectors" - Mario Contaldi.

—"Basic Report for the Analysis of Technological Options Applicable in Italy to Reduce Carbon Dioxide Emissions in Other End-Use Sectors" - Giuseppe Ondrio.

—"Technological Options for the Reduction of Emissions of Methane of Anthropogenic Origin" - Anna M. Castagnola and Guido R. Guidotti.

—"Energy Efficiency and Climate - Ongoing Study on Technological Options for Reducing CO₂ Emissions in Italy" - M. Contaldi, G. Onufrio, G.C. Pinchera, G.C. Tosato. Proceedings of the 2nd International Workshop, Laxemburg, Austria, 1992.

3. Only in the latter stage of this debate will research begin on the best-suited reduction options (regulatory, rate-based, economic, organizational, etc.)—and this research differs from country to country—with a view to implementing the desired options. On the topic of political measures and administrative instrumentalities, see also M. Contaldi and G.C. Tosato: "Data and Scenarios for the National Program To Limit Greenhouse Gas Emissions from the Energy System." ENEA Report Erg-Stra 194001, February 1994.

4. The Markal model generator and relative software were developed jointly by the BNL (U.S.) and KFA (Germany) laboratories in 1978 pursuant to a cooperative agreement among 15 countries of the OECD [Organization for Economic Cooperation and Development] covering the Energy Technologies Systems Analysis Project [ETSAP] under the aegis of the Paris-based AIE [International Energy Agency]. Since then, the Markal software has been continually improved, applied to some 50 national and local energy systems, described in numerous publications, and used to produce hundreds of studies on the interactions among economy, energy, environment, and research.

5. In reality, the model extends the capacity of the bottom-up method to include some properties of the top-down models, in that the energy-services demand is at least partially sensitive to energy price changes deriving from the imposition of CO₂ emission constraints.

6. The graph of the model includes for each period of time approximately 100 supply technologies, 350 end-use technologies, some 20 energy-services demand sectors, approximately 30 energy carriers (each characterized by a number of variable data ranging between 5 and 50). The quantity of variables supported by the model is also very high (around 15,000 for the whole of the nine time periods).

7. Economic values for which the text does not specify the monetary unit [or unless otherwise specified] are in 1990 Italian lire.

8. Values are taken from the final report of Annex IV of ETSAP/AIE4, Volume 1 "Comparison and Aggregations," second draft of March 1993, drawn up by the ECN/ESC of Petten (Netherlands), ETSAP Operational Agent for Annex IV.

UNITED KINGDOM

Nuclear Official Views Decisions Made by Environmentalists

MS0510103494 London *THE INDEPENDENT* in English 5 Oct 94 P 14

[Article by Roger Hayes, Director-General of the British Nuclear Industry Forum: "Nuclear: Clean, Green and Better for You"]

[FBIS Transcribed Text] In any fight, there are always the good guys—whom we all cheer—and the bad guys—whom we all boo—and there is a referee. Our view of the referee depends on the outcome of the bout.

In the environment debate there is little doubt that Greenpeace has been seen as the good guy and the nuclear industry as the bad. So the recent decision by the Advertising Standards Authority (ASA) to rule against Greenpeace and in favour of the nuclear industry made many people sit up and think.

The advertisement in question—which featured a photograph of a baby with a grotesquely enlarged head—clearly overstepped the mark of the acceptable. The ASA's ruling was naturally welcomed by the nuclear industry as an important propaganda and psychological victory.

Greenpeace's decision to run a second, very defensive, advert in the Independent on the day after the ASA decision suggests that a fundamental shift may be about to take place in the environmental debate: Greenpeace and its green ilk being forced on to the defensive and the nuclear industry becoming more confident of winning the argument.

The problem thus far has been the reluctance of environmentalists, industrialists and even politicians to address the issues rationally. The role of industry and single-issue pressure groups here is crucial and their influence must not be underestimated (in 1990, for example, Greenpeace had more members than the Labour Party). Emotions have run high and facts have been in short supply. This has led to a number of bad decisions which have not protected the environment or raised the credibility of those concerned with its welfare.

The origins of this problem go back 20 years to the banning of DDT [Dichloro Diphenyl Trichloroethane], a decision that marked the beginning of the modern environmental movement. A massive campaign against the perceived health risks of DDT forced the US Environmental Protection Agency (EPA) to hold a seven-month hearing. The EPA examiner, having looked at the scientific evidence, recommended that DDT should not be banned.

However William Ruckelshaus, the EPA's administrator, overruled that decision for what he said were political rather than scientific reasons. American public opinion had been raised to such a fever pitch that it was felt that a decision based merely on the evidence was not possible.

The consequence, according to Professor JD Edwards of San Jose State University, was that "an estimated 100 million people die every year as the direct result of the banning of DDT and other pesticides. These deaths are from malaria, from other insect-borne diseases, and from the results of reduced food crops". The banning of DDT was an inauspicious omen for what was to become a sustained mass environmental movement.

It would be unfair, however, to cast the environmental movement completely as the bad guy. While it is perhaps inevitable that public opinion has more clout than the scientific community, the resulting mess cannot be blamed solely on the environmentalists. Industrialists and politicians are sometimes equally to blame for their failure to give leadership or to address the issues.

A classic example was the campaign to ban the use of lead in petrol. Initially the petrol companies dismissed the criticisms of lead in petrol and refused to meet the campaigns' leaders. It was not until the level of public outcry threatened to dent the profits of the companies that action was taken.

Unfortunately the action taken was the knee-jerk response to replace the lead in petrol with larger quantities of benzene. Benzene is arguably the major cause of childhood leukemia and today cars are pumping 50,000 tons a year into the UK environment. Catalytic converters, which could neutralise the benzene, are not widely available and are not effective in cities. The result has been to replace one problem with what many experts consider to be a worse one.

At long last there are signs that industrialists and environmentalists are working together. A recent ruling in

the US by the EPA, requiring that 15 per cent of reformulated petrol should be produced using ethanol, sparked this comment: "The fossil fuel savings obtained by the use of ethanol from corn is largely cancelled by the greater use of fossil fuels in the actual growing and processing of corn to make ethanol." That was the opinion not of the oil companies but of the influential green Environmental Defense Fund.

This new sense of realism on the environment is to be welcomed. It may be inconvenient or even unpopular, but the facts are on the side of the nuclear industry: namely, nuclear power is the clean energy.

During the summer there was much media coverage about the suffering caused to asthma sufferers in our cities by car exhaust emissions. This brought home the fact that we are all affected by the environment in which we live. The environment is, after all, not just an issue for people who live in the countryside.

We can all agree about the need for Britain to reduce its levels of harmful emissions. Indeed, we are committed to meeting the targets set at the Rio Earth Summit regarding emissions of carbon dioxide—the major gas associated with global warming—and the targets set by the European Union for reducing emissions of sulphur dioxide and oxides of nitrogen, both sources of acid rain. What must be better understood is that nuclear power reactors produce none of these pollutants. This is in sharp contrast to fossil fuel power stations, which account for 70 per cent of Britain's sulphur dioxide emissions and 30 per cent of its carbon dioxide emissions. The nuclear industry is without question the good guy when it comes to tackling the problems of global warming and acid rain.

As people's strong feelings on the environment become more rooted in fact and science rather than gloom and doom, and as the nuclear industry becomes ever more self-confident and assertive, a new consensus will emerge. Nuclear energy will not only be a crucial part of that new consensus but will also play a critical role in shaping the West's sustainable development policies. The sooner the green movement accepts this, the better.

Greenpeace Alleges Safety Laws Broken at Nuclear Waste Site

MS1010115094 London *THE INDEPENDENT*
in English 10 Oct 94 p 7

[Report by Tom Wilkie: "Radioactive Waste Site 'Breaking Safety Laws'"]

[FBIS Transcribed Text] Activists from Greenpeace, the environmental group, have secretly entered Britain's largest radioactive dump site, Drigg, near Sellafield in Cumbria, and found what they claim to be breaches of safety laws.

The group entered the site under cover of darkness in July without being challenged. They allege that intermediate-level waste—which is more radioactive than that

permitted for disposal at Drigg—and untreated flammable items were being dumped there.

They also claim that waste was being tipped into trenches which were not covered by soil as required by law. Greenpeace warned that "despite the obvious failing of current safety regulations" the Government might soon permit radioactive waste to be dumped at local authority landfill sites scattered around the country. The Department of the Environment is conducting a review of nuclear waste disposal policy. In a discussion document issued for public comment, the department raises the possibility of allowing more radioactive waste to go to local landfill sites rather than to the national facility at Drigg.

Bridget Woodman, Greenpeace's nuclear campaigner, said: "The Government proposals will only serve to spread our nuclear waste all over the country. Bringing in laxer laws will put even more people at risk."

Drigg is permitted to take only low-level radioactive waste, but the Government is considering altering the definition of "intermediate-level waste" so that some of it, with comparatively short-lived radioactivity, could be dumped at Drigg.

If the Government decided to change policy in this way, only long-lived intermediate wastes—essentially those contaminated with plutonium in the course of reprocessing operations at Sellafield—would have to be buried deep underground. The nuclear industry is believed to

favour this option, since it would make it much cheaper to dispose of intermediate-level wastes produced at nuclear power stations as none of these are contaminated with plutonium.

The allegations of safety breaches at Drigg were dismissed by HM Inspectorate of Pollution which is responsible for authorising disposals there. A spokesman said: "There is nothing we know of in the Greenpeace report which requires action by us in terms of emissions or discharges to the environment. We inspect the place regularly, and we are satisfied nothing has gone there that should not have done so." According to British Nuclear Fuels, which owns and operates the site, Drigg's 300-acre fenced site is regularly patrolled by the UK Atomic Energy Authority constabulary. No one could walk in, but the fence could be scaled. The radiation risk to anyone entering the site was minimal.

A spokeswoman for the company said: "The occupational radiation dose to those working at Drigg is less than a half the average UK dose from natural background sources."

Standards of safety and general "good housekeeping" at Drigg were savagely criticised by an extraordinarily outspoken report from the House of Commons Select Committee on the Environment in 1986.

Since that report, standards at the site have been improved but "tumble tipping" into open trenches continued. The last such trench will be full and capped at the end of this year. Thereafter, all dumping will be sealed in compacted containers in concrete lined vaults.

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